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ACUTE LETHALITY DATA FOR ONTARIO'S PETROLEUM REFINERY EFFLUENTS COVERING THE PERIOD FROM JUNE 1989 TO NOVEMBER 1989

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ACUTE LETHALITY DATA FOR ONTARIO'S PETROLEUM REFINERY EFFLUENTS COVERING THE PERIOD FROM JUNE 1989 TO NOVEMBER 1989

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Contents

	page
Esso Petroleum Canada, Nanticoke	
trout	1
Daphnia	11
Esso Petroleum Canada, Sarnia	
trout	21
Daphnia	37
NOVA Petrochemicals Inc. (Corunna),Sarnia	
trout	53
Daphnia	63
Petro-Canada Inc., Mississauga	
trout	73
Daphnia	89
Petro-Canada Inc.,Oakville	
trout	105
Daphnia	115
Shell Canada Products Limited, Sarnia	
trout	125
Daphnia	141
Suncor Inc., Sarnia	
trout	157
Daphnia	175

SUMMARY

Ontario' Regulation 359/88 as amended to Regulation 696/88 under the Environmental Protection Act requires Petroleum Refineries to monitor their discharge (both process and cooling waters) for acute lethality to trout and to *Daphnia magna* by conducting laboratory toxicity tests. In general, toxicity tests are used as a rapid technique to assess the potential impact of complex effluents on the aquatic environment. In acute lethality toxicity testing, aquatic organisms are introduced to several dilutions of effluent starting with undiluted effluent. The LC50 or the estimated concentration of effluent that causes 50% mortality is generally used as the quantitative measure of toxicity. Non-lethal effluents are considered less likely to produce adverse impacts in the environment after dilution. The following data report presents the toxicity results of this monitoring along with the results of audit samples that were tested at the Ministry's lab in Rexdale. In addition, toxicity tests on some intake waters were also submitted by industry and these have been included in this report.

The Petroleum Monitoring Regulation required dischargers, where feasible, to collect information on their operations; and monitoring data from their effluents, and to provide this information to the Ministry. The timing of toxicity sampling was arranged to coincide with chemical characterization, also as required under this regulation. The frequency of these samples was monthly for both toxicity test procedures on process effluents with the exception that if tests over three consecutive months showed insignificant mortalities with trout then in subsequent months a single concentration test may be used. For cooling water effluents, the required frequency of sampling and testing was quarterly. All acute lethality testing was conducted according to Ministry protocols (Protocol To Determine The Acute Lethality Of Liquid Effluents To Fish. Env. Ontario July 1983 and *Daphnia magna* Acute Lethality Toxicity Test Protocol. Env. Ontario April 1988).

Of the more than 50 samples that were tested for toxicity to fish, only the process effluent at Petro Canada refinery in Oakville had a sample that caused significant mortalities. The sample collected on June 12, 1989 was acutely lethal to trout with a 96 hour LC50 of 80.6 % (95 % fiducial limits : 66.1 - 98.2 %). Chemical analysis of another sample collected on the same day provide probable causes to observed lethality. The sample was measured to have concentrations of 155 ppb of zinc and 4.2 ppm of total ammonia. Studies have shown zinc to be acutely lethal to trout at concentrations lower than 155 ppb. The calculated un-ionized ammonia concentration for a measured total ammonia concentration of 4.2 ppm, pH 8.5 and at 15 C, would be approximately be 0.336 ppm. An un-ionized ammonia concentration of 0.336 ppm would be considered to be near the threshold lethal levels. Studies have shown levels above 0.5 ppm are strongly toxic to many varieties of fish. It is highly probable the concentrations of zinc and un-ionized ammonia in the effluent collected on June 12th were contributors to the observed lethality in the bioassay.

It is clear that for trout, samples from the Petroleum refineries during this period had little effect on acute lethality. None of the samples collected from the cooling water effluents or from the intake supplies were acutely lethal to trout. None of the audit samples caused significant mortalities to trout which was consistent with the results supplied by the industry.

Of the more than 50 effluent samples that were tested for toxicity to *Daphnia*, only one sample from each of the Petro-Canada refineries in Oakville and Mississauga had LC50s less than or equal to 100% effluent for *Daphnia*. The sample which was most toxic was a process effluent sample collected from the Oakville refinery on November 11, 1989 which had an 48 h LC50 of 49.6%. Four different chemicals may have contributed to the *Daphnia* toxicity. Chromium (126 ug/L), aluminum (434 ug/L), unionized ammonia (≈ 68 ug/L, @ 20 C and pH = 8.0) and oil and grease (1 mg/L) were measured at levels which can cause lethality to *Daphnia* in laboratory tests.

A sample of process effluent collected on September 20, 1989 from the Mississauga refinery had a 48 h LC50 of 97%. This sample also had high concentrations of aluminum and chromium, and moderately high levels of zinc. All of these chemicals may have contributed to the toxicity of the sample to *Daphnia*.

There were a small number of additional samples that caused some mortalities, but none of these had LC50s of less than or equal to 100% effluent. Three of these samples demonstrated significant sublethal toxicity where greater than 75% of the neonates were immobilized or floating at the end of the test. One sample demonstrated an unusual type of toxicity response where almost all the test animals were immobile in all test concentrations, and the highest mortality rates were recorded in the 15% effluent concentration. This type of response occurs in some types of effluents, and the causative agent(s) have not yet been identified. In another sample (pg. 93) a number of neonates were floating at the 24 hour observation point, but these animals had recovered by the end of the test. This response is often seen with low concentrations of emulsifiers, or benzene-related compounds.

In general, the reporting of toxicity data by the industries went smoothly. The quality of the toxicity results and presentation has been good. The amended General Effluent Monitoring regulation 533/89 under the Environmental Protection Act (dated September 29, 1989) provided additional instructions to the reporting of bioassay data in cases where there were mortalities in one or more effluent concentrations but not at a significant level to calculate a LC50. This data type was required to be reported with the LC50 field marked with >100 %. For the few instances where this type of data was observed, prior to the amendment of the regulation, the results were reported as "non-lethal". This interpretation is probably correct for the majority however there were some results which may have or may not have indicated a toxic effect from the effluent sample. The uniform reporting requirement will flag all these occurrences for assessment of significance. The comment fields on the Toxicity Test Reports were filled by the labs performing the tests, and should not be expected to be consistent across samples. The following portion of this report presents the acute lethality data, as submitted by industry, grouped by company. A summary of each company's results precedes each grouping of individual sample results.

COMPANY: Esso Petroleum Canada, Nanticoke (520205)
SECTOR: Petroleum Refining
REGION: West Central

SUMMARY
The data for six acute lethality trout bioassays, conducted on process effluent samples collected between June and November 1989 were provided by Esso Petroleum Canada - Nanticoke Refinery (formerly Texaco Canada Inc. and McColl-Frontenac Inc.). All six process effluent samples were determined to have been not acutely lethal to test fish.

Process Effluent

06890296 sampled: 06/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890459 sampled: 07/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890635 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01890237 sampled: 08/30/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

06890798 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06890998 sampled: 10/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06891051 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01890278 sampled: 11/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

storm water

landfarm leachate

EO-leachate-creek

MISA - Trout

TOXICITY TEST REPORT Sample: 06890296

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 06/06/89
Received : 06/07/89
Tested : 06/07/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890296

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
100	pH	8.0	8.0	8.0	8.0	8.1
	O2 ppm	7.0	8.7	8.0	8.0	7.6
	Cond.	1612	1500		1486	1475
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	8.0	8.0	8.0	8.0	8.1
	O2 ppm	7.6	8.9	8.7	8.3	8.4
	Cond.	1656	1595		1502	1622
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	8.1	8.0	8.1	8.1	8.0
	O2 ppm	7.7	8.8	8.1	8.2	7.4
	Cond.	383	367		348	411
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	8.1	8.1	8.1	8.1	8.2
	O2 ppm	9.0	8.9	8.3	8.4	8.6
	Cond.	382	380		392	379
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890459

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 07/11/89
Received : 07/13/89
Tested : 07/13/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : Moving Average

TOXICITY TEST PARAMETERS

Sample Number: 06890459

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
100	pH	7.8	8.4	8.5	8.3	8.4
	O2 ppm	9.2	9.4	8.6	7.4	8.5
	Cond.	2400				2350
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.9	8.4	8.4	8.3	8.3
	O2 ppm	9.4	9.3	8.2	8.9	7.4
	Cond.	2260				2160
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.9	8.2	8.2	8.1	8.1
	O2 ppm	9.8	9.6	8.7	8.6	8.6
	Cond.	385				364
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	8.3	8.2	8.2	8.2
	O2 ppm	10.0	9.4	8.9	8.4	7.7
	Cond.	405				403
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890635

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUHELIS
Date Collected : 08/08/89
Received : 08/10/89
Tested : 08/10/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890635

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.3	8.2	8.2	8.2	8.0
	O2 ppm	7.9	7.2	8.2	7.3	8.2
	Cond.	2520				2470
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	8.1	8.1	8.0	8.3	8.2
	O2 ppm	8.5	8.2	7.2	8.8	8.3
	Cond.	1754				1682
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.0	8.3	8.2	8.2	8.1
	O2 ppm	8.5	9.3	8.2	8.3	8.7
	Cond.	1467				1367
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.9	8.3	8.3	8.2	8.2
	O2 ppm	8.4	9.5	9.2	9.3	8.7
	Cond.	1051				992
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	8.2	8.1	8.2	8.1
	O2 ppm	8.3	8.6	7.4	8.3	8.7
	Cond.	829				795
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	8.2	8.2	8.2	8.1
	O2 ppm	8.8	9.3	8.0	8.8	7.8
	Cond.	600				563
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.7	8.1	8.1	8.0
	O2 ppm	8.2	7.8	8.4	8.3	8.3
	Cond.	371				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890237

TEST CONDITIONS

Company : Esso Petroleum Canada
Wanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : G. Perkons
Date Collected : 08/30/89
Received : 08/30/89
Tested : 09/01/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	00:30	01:00	02:00	04:00	19:00	45:30	67:30	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	1	10
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890237

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	19:00	45:30	67:30	96:0
100	pH	8.4	8.4				8.1	8.3	8.3	8.
	O2 ppm	8.1	9.3				9.4	9.8	9.7	9.
	Cond.	1080	1100				1060	1060	1050	105
	Temp(C)	15.0	15.0				14.0	14.0	14.0	14.
65	pH		8.5				8.2	8.1	8.2	8.
	O2 ppm		9.1				9.3	9.8	9.6	9.
	Cond.		760				750	750	770	78
	Temp(C)		15.0				14.0	14.0	14.0	14.
40	pH		8.5				8.2	8.3	8.3	8.
	O2 ppm		9.5				9.6	10.0	9.9	9.
	Cond.		540				500	560	560	58
	Temp(C)		15.0				14.0	14.0	14.0	14.
30	pH		8.6				8.2	8.3	8.3	8.
	O2 ppm		9.8				9.6	10.0	10.0	9.
	Cond.		490				450	480	480	49
	Temp(C)		15.0				14.0	14.0	14.0	14.
20	pH		8.7				8.2	8.3	8.2	8.
	O2 ppm		9.6				9.7	10.1	10.0	9.
	Cond.		425				400	400	400	41
	Temp(C)		15.0				14.0	14.0	14.0	14.
10	pH		8.9				8.2	8.3	8.2	8.
	O2 ppm		9.6				9.5	10.0	10.0	9.
	Cond.		400				330	330	330	35
	Temp(C)		15.0				14.0	14.0	14.0	14.
Control	pH		7.3				7.1	7.4	7.8	7.
	O2 ppm		9.2				9.6	9.6	9.6	9.
	Cond.		265				260	255	275	26
	Temp(C)		15.0				14.0	14.0	14.0	14.

MISA - Trout

TOXICITY TEST REPORT Sample: 06890798

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUMELIS
Date Collected : 09/05/89
Received : 09/06/89
Tested : 09/06/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890798

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.2	8.6	8.6	8.6	8.6
	O2 ppm	7.6	8.8	9.7	9.7	9.7
	Cond.	2240				2240
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	8.1	8.4	8.5	8.5	8.4
	O2 ppm	7.6	8.7	9.6	9.6	9.6
	Cond.	2230				2040
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	8.1	8.2	8.2	8.1
	O2 ppm	8.3	8.4	9.7	9.6	9.7
	Cond.	373				381
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	8.2	8.2	8.2	8.2
	O2 ppm	8.4	9.2	9.8	9.7	9.8
	Cond.	359				379
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890998

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUMELIS
Date Collected : 10/10/89
Received : 10/11/89
Tested : 10/11/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890998

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.7	8.2	8.2	8.1	8.1
	O2 ppm	8.8	9.8	9.6	9.6	9.5
	Cond.	2220				2340
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.7	8.0	8.1	8.1	8.1
	O2 ppm	8.9	9.8	9.8	9.7	9.3
	Cond.	1609				1792
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.7	8.0	8.0	8.1	8.1
	O2 ppm	8.8	9.7	9.6	9.5	9.2
	Cond.	1355				1462
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.6	8.0	8.0	8.1	8.1
	O2 ppm	8.9	9.8	9.8	9.6	9.4
	Cond.	928				1004
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.6	8.0	8.1	8.1	8.1
	O2 ppm	9.2	9.8	9.5	9.4	9.4
	Cond.	745				807
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	8.0	7.9	8.0	8.0
	O2 ppm	9.1	9.8	9.3	9.2	9.1
	Cond.	551				648
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.0	8.0	8.1	8.1
	O2 ppm	9.7	9.0	8.6	8.9	9.2
	Cond.	355				348
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06891051

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUHELIS
Date Collected : 11/06/89
Received : 11/07/89
Tested : 11/07/89 at: 1030

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0
100	0	0	0	0	0	0
100	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891051

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
Control	pH	8.2	8.3	8.4	8.1	8.1
	O2 ppm	8.5	9.0	9.9	9.1	8.9
	Cond.	309				314
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	8.2	8.3	8.4	8.0	8.1
	O2 ppm	8.6	9.5	9.5	8.6	8.8
	Cond.	312				342
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	8.0	8.5	8.5	8.1	8.0
	O2 ppm	7.9	9.9	9.9	8.9	9.1
	Cond.	1756				1808
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	8.0	8.4	8.4	8.1	8.1
	O2 ppm	8.8	9.8	9.9	9.1	8.9
	Cond.	1841				1917
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890278

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : M. Smithson
Date Collected : 11/29/89
Received : 11/30/89
Tested : 12/01/89 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	01:10	01:00	02:00	04:00	25:10	51:10	76:00	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890278

TEST CONC. %		ELAPSED TIME 00:00	01:10	01:00	02:00	04:00	25:10	51:10	76:00	96:0
100	pH	7.6		8.1	8.2	8.2	8.2			8.
	O2 ppm	8.1		10.2	9.6	9.8	10.3			9.
	Cond.	1500		1500	1475	1450	1520			150
	Temp(C)	14.0		14.0	14.0	14.0	15.0			15.
65	pH			8.1	8.0	8.0	8.0			8.
	O2 ppm			10.2	9.5	9.6	10.0			9.
	Cond.			1040	1070	1090	1060			110
	Temp(C)			14.0	14.0	14.0	15.0			15.
40	pH			8.1	8.0	8.0	8.0			8.
	O2 ppm			10.3	9.5	9.7	10.1			9.
	Cond.			760	760	760	760			76
	Temp(C)			14.0	14.0	14.0	15.0			15.
30	pH			8.0	7.8	7.8	7.8			7.
	O2 ppm			10.0	9.1	9.3	9.9			9.
	Cond.			620	640	625	620			64
	Temp(C)			14.0	14.0	14.0	15.0			15.
20	pH			7.9	7.5	7.5	7.6			8.
	O2 ppm			9.8	7.7	8.1	9.0			10.
	Cond.			490	490	485	480			52
	Temp(C)			14.0	14.0	14.0	15.0			15.
10	pH			8.1	7.3	7.3	7.6			7.
	O2 ppm			10.3	7.5	8.3	9.3			8.
	Cond.			375	370	370	365			38
	Temp(C)			14.0	14.0	14.0	15.0			15.
Control	pH			8.1	7.8	7.9	7.9			8.
	O2 ppm			10.3	9.6	9.7	10.2			10.
	Cond.			250	260	250	260			26
	Temp(C)			14.0	14.0	14.0	15.0			15.

COMPANY: Esso Petroleum Canada, Nanticoke (520205)
SECTOR: Petroleum Refining
REGION: West Central

SUMMARY
Data for six Daphnia magna acute lethality toxicity testsconducted on process effluent samples collected between June and November 1989 were supplied by Esso Petroleum Canada - Nanticoke Refinery (formerly Texaco Canada Inc. and McColl-Frontenac Inc.). All six samples were not acutely lethal to Daphnia. Two process effluent samples were tested in the M.O.E. laboratory. The sample tested in November was non-lethal, and the sample tested in August had a 48 h LC50 >100 %.

Process Effluent

06890297 sampled: 06/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 hrs

06890460 sampled: 07/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: No mortality or immobility observed in 48hrs

06890636 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48HRS

02890237 sampled: 08/30/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06890799 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48HRS.

06890999 sampled: 10/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06891052 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

02890278 sampled: 11/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

Esso Petroleum Canada (continued)

storm water

landfarm leachate

EO-leachate-creek

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890297

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 06/06/89
Received : 06/07/89
Tested : 06/07/89 at: 430

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890297

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.8		8.1
	O2 ppm	7.8		8.5
	Cond.	1684		1668
	Temp(C)	20.0	20.0	20.0
65	pH	7.9		8.1
	O2 ppm	8.1		8.5
	Cond.	1247		1227
	Temp(C)	20.0	20.0	20.0
50	pH	8.0		8.1
	O2 ppm	8.4		8.3
	Cond.	1050		1031
	Temp(C)	20.0	20.0	20.0
30	pH	8.1		8.1
	O2 ppm	8.5		8.7
	Cond.	788		771
	Temp(C)	20.0	20.0	20.0
20	pH	8.1		8.1
	O2 ppm	8.6		8.6
	Cond.	639		627
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.0
	O2 ppm	8.6		8.7
	Cond.	512		497
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		7.9
	O2 ppm	8.7		8.8
	Cond.	376		375
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890460

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : Grab
Sampled By : Rob Bumelis
Date Collected : 07/11/89
Received : 07/13/89
Tested : 07/13/89 at: 1430

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : No mortality or immobility observed in 48hrs

SLOPE of Mortality Curve :
LC50 Calculated By : Moving Average

TOXICITY TEST PARAMETERS

Sample Number: 06890460

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.7		8.5
	O2 ppm	4.8		8.2
	Cond.	2280		2210
	Temp(C)	20.0	20.0	20.0
65	pH	7.8		8.4
	O2 ppm	6.8		8.5
	Cond.	1767		1584
	Temp(C)	20.0	20.0	20.0
50	pH	7.9		8.4
	O2 ppm	7.4		8.4
	Cond.	1390		1246
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.4
	O2 ppm	7.8		8.7
	Cond.	1045		924
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.4
	O2 ppm	7.7		8.4
	Cond.	827		735
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.4
	O2 ppm	8.2		8.8
	Cond.	630		569
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.2
	O2 ppm	8.4		8.7
	Cond.	349		363
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890636

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUMELIS
Date Collected : 08/08/89
Received : 08/10/89
Tested : 08/10/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890636

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.2		8.3
	O2 ppm	7.9		8.2
	Cond.	2120		2130
	Temp(C)	20.0	20.0	20.0
65	pH	8.2		8.2
	O2 ppm	8.3		8.3
	Cond.	1553		1590
	Temp(C)	20.0	20.0	20.0
50	pH	8.2		8.2
	O2 ppm	8.3		8.2
	Cond.	1281		1300
	Temp(C)	20.0	20.0	20.0
30	pH	8.2		8.2
	O2 ppm	8.3		8.5
	Cond.	922		930
	Temp(C)	20.0	20.0	20.0
20	pH	8.2		8.2
	O2 ppm	8.4		8.1
	Cond.	729		735
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.2
	O2 ppm	9.1		8.2
	Cond.	542		540
	Temp(C)	20.0	20.0	20.0
Control	pH	7.8		7.8
	O2 ppm	9.0		8.3
	Cond.	348		342
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890237

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : I Perkons
Date Collected : 08/30/89
Received : 08/30/89
Tested : 08/30/89 at: 1145

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	1	5	41
60	0	0	0	1	8
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890237

TEST CONC. %		ELAPSED TIME 00:00	01:00	24:00	48:00
100	pH	7.9			8.1
	O2 ppm	7.6			7.7
	Cond.	1234			1238
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	8.0			8.0
	O2 ppm	7.9			7.7
	Cond.	857			861
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.1			8.0
	O2 ppm	8.0			7.7
	Cond.	590			590
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	8.2			7.8
	O2 ppm	8.0			7.7
	Cond.	443			452
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.3			7.8
	O2 ppm	8.1			7.6
	Cond.	344			352
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.3			7.9
	O2 ppm	8.0			7.6
	Cond.	309			299
	Temp(C)	20.0	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890799

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUMELIS
Date Collected : 09/05/89
Received : 09/06/89
Tested : 09/06/89 at: 1545

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48HRS.

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890799

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.1		8.5
	O2 ppm	7.4		8.4
	Cond.	2300		2250
	Temp(C)	21.0	20.0	20.0
65	pH	8.1		8.4
	O2 ppm	8.0		8.2
	Cond.	1584		1541
	Temp(C)	21.0	20.0	20.0
50	pH	8.1		8.4
	O2 ppm	8.1		8.3
	Cond.	1320		1283
	Temp(C)	21.0	20.0	20.0
30	pH	8.1		8.3
	O2 ppm	8.4		8.4
	Cond.	950		943
	Temp(C)	21.0	20.0	20.0
20	pH	8.1		8.3
	O2 ppm	8.4		8.5
	Cond.	780		761
	Temp(C)	21.0	20.0	20.0
10	pH	8.1		8.2
	O2 ppm	8.4		8.5
	Cond.	585		564
	Temp(C)	21.0	20.0	20.0
Control	pH	8.0		8.0
	O2 ppm	8.8		8.6
	Cond.	363		363
	Temp(C)	21.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890999

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUMELIS
Date Collected : 10/10/89
Received : 10/11/89
Tested : 10/11/89 at: 1740

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890999

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	7.8		8.2
	O2 ppm	8.5		8.4
	Cond.	2150		2140
	Temp(C)	20.0	20.0	20.0
65	pH	7.9		8.2
	O2 ppm	8.8		8.2
	Cond.	1574		1564
	Temp(C)	20.0	20.0	20.0
50	pH	7.9		8.2
	O2 ppm	8.8		8.4
	Cond.	1284		1281
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.2
	O2 ppm	8.8		8.2
	Cond.	913		912
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.2
	O2 ppm	8.6		8.3
	Cond.	746		742
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.2
	O2 ppm	8.6		8.3
	Cond.	566		536
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.0
	O2 ppm	8.8		8.1
	Cond.	333		361
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06891052

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : ROB BUMELIS
Date Collected : 11/06/89
Received : 11/07/89
Tested : 11/07/89 at: 1630

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY
%				%
Control	0	0	0	0
10	0	0	0	0
20	0	0	0	0
30	0	0	0	0
50	0	0	0	0
65	0	0	0	0
100	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891052

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
Control	pH	8.0		8.0
	O2 ppm	9.4		8.4
	Cond.	349		353
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.0
	O2 ppm	8.7		8.4
	Cond.	458		496
	Temp(C)	20.0	20.0	20.0
20	pH	7.9		8.0
	O2 ppm	8.6		8.5
	Cond.	710		730
	Temp(C)	20.0	20.0	20.0
30	pH	7.8		8.0
	O2 ppm	8.8		8.4
	Cond.	839		840
	Temp(C)	20.0	20.0	20.0
50	pH	7.7		8.0
	O2 ppm	9.1		8.5
	Cond.	1138		1059
	Temp(C)	20.0	20.0	20.0
65	pH	7.7		8.0
	O2 ppm	9.0		8.5
	Cond.	1375		1390
	Temp(C)	20.0	20.0	20.0
100	pH	7.5		7.9
	O2 ppm	8.9		8.5
	Cond.	1845		1850
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890278

TEST CONDITIONS

Company : Esso Petroleum Canada
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : M. Smithson
Date Collected : 11/29/89
Received : 11/30/89
Tested : 11/30/89 at: 1300

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	01:00	24:00	48:49	TOTAL MORTALITY %
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890278

TEST CONC. %		ELAPSED TIME 00:00	01:00	24:00	48:49
100	pH	7.6			8.0
	O2 ppm	7.6			8.1
	Cond.	1820			1820
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	7.8			7.9
	O2 ppm	8.6			7.7
	Cond.	1260			1198
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	7.9			7.8
	O2 ppm	8.9			7.8
	Cond.	795			752
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	7.9			7.8
	O2 ppm	9.0			7.9
	Cond.	549			544
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.1			7.9
	O2 ppm	9.2			8.2
	Cond.	387			391
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.2			7.9
	O2 ppm	9.3			8.4
	Cond.	310			314
	Temp(C)	20.0	20.0	20.0	20.0

COMPANY: Esso Petroleum Canada, Sarnia (70102)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six acute lethality trout bioassays, conducted on process effluent samples between June and November 1989 were provided by Esso Petroleum Canada - Sarnia Refinery. All six process effluents were determined to have been not acutely lethal to test fish. Toxicity tests were also conducted on two samples from each of CW.-Sep.3, CW.-9 and CW.-Sep 11 & 12 sampling locations. All six samples were not acutely lethal to test fish.

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intake water

process effluent

05890044 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890050 sampled: 07/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890060 sampled: 08/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890070 sampled: 09/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890072 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890094 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890275 sampled: 11/28/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

CW-SEP. 11&12

05890064 sampled: 08/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890117 sampled: 11/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.9

05890063 sampled: 08/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890116 sampled: 11/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.3

05890065 sampled: 08/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890118 sampled: 11/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

MISA - Trout

TOXICITY TEST REPORT Sample: 05890044

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/06/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	21:00	43:00	68:25	96:00	TOTAL MORTALITY
%						%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890044

TEST CONC.		ELAPSED TIME 00:00	21:00	43:00	68:25	96:00
%						
100	pH	7.1	7.2	7.3	7.5	7.4
	O2 ppm	8.0	8.2	8.2	9.0	9.5
	Cond.	700				690
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.3	7.4	7.5	7.4
	O2 ppm	8.2	8.0	7.6	8.8	9.6
	Cond.	680				690
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.3	7.4	7.4	7.3
	O2 ppm	9.5	8.6	8.4	9.4	10.1
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.4	7.5	7.4	7.3
	O2 ppm	9.5	9.2	9.0	9.4	10.1
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890050

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 07/03/89
Received : 07/03/89
Tested : 07/04/89 at: 1445

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:55	47:55	74:55	96:05	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890050

TEST CONC. %		ELAPSED TIME 00:00	19:55	47:55	74:55	96:05
100	pH	6.9	7.4	7.3	7.3	7.4
	O2 ppm	7.4	8.9	9.6	9.2	9.4
	Cond.	600				600
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	6.9	7.2	7.2	7.3	7.3
	O2 ppm	7.4	7.9	8.8	8.7	9.3
	Cond.	600				600
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.4	7.3	7.5	7.4
	O2 ppm	9.8	8.4	9.6	9.5	9.6
	Cond.	174				186
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.5	7.3	7.5	7.4
	O2 ppm	9.6	8.4	8.4	9.2	9.4
	Cond.	172				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890060

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 08/14/89
Received : 08/14/89
Tested : 08/15/89 at: 1200

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:00	45:00	69:00	96:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890060

TEST CONC.		ELAPSED TIME				
%		00:00	21:00	45:00	69:00	96:10
100	pH	7.2	7.4	7.3	7.6	7.4
	O2 ppm	8.2	9.4	9.1	9.3	9.3
	Cond.	660				625
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.4	7.3	7.4	7.4
	O2 ppm	8.2	9.3	9.1	9.0	9.0
	Cond.	640				640
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.4
	O2 ppm	9.8	9.8	9.4	9.6	9.6
	Cond.	170				177
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.4
	O2 ppm	9.6	9.4	9.2	9.4	9.4
	Cond.	170				177
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890070

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 09/11/89
Received : 09/11/89
Tested : 09/12/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	17:00	48:55	65:00	96:55	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890070

TEST CONC. %		ELAPSED TIME 00:00	17:00	48:55	65:00	96:55
100	pH	7.4	7.1	7.1	7.1	7.2
	O2 ppm	8.7	7.2	8.2	7.2	5.8
	Cond.	680				680
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	7.2	7.1	7.1	7.2
	O2 ppm	8.5	7.3	7.8	7.3	5.6
	Cond.	680				630
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.2	7.2
	O2 ppm	9.9	7.9	9.0	7.9	7.2
	Cond.	168				155
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.1	7.1	7.1	7.2
	O2 ppm	9.8	7.5	7.6	7.5	7.5
	Cond.	168				158
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890072

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1525

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	18:15	44:05	70:15	96:05	TOTAL MORTALITY
%						%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890072

TEST CONC. %		ELAPSED TIME 00:00	18:15	44:05	70:15	96:05
100	pH	7.2	7.2	7.0	7.1	7.2
	O2 ppm	8.9	7.7	7.4	7.2	7.2
	Cond.	505				492
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.2	7.0	7.2	7.2
	O2 ppm	8.7	7.2	7.4	7.2	7.0
	Cond.	495				490
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.1	7.4	7.4	7.4
	O2 ppm	10.1	8.9	8.6	8.3	8.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.1	7.1	7.3	7.3
	O2 ppm	10.0	9.2	8.8	8.7	8.2
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890094

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1800

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	22:30	40:00	64:00	96:00	TOTAL MORTALITY %
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890094

TEST CONC. %		ELAPSED TIME 00:00	22:30	40:00	64:00	96:00
100	pH	7.2	7.2	7.5	7.4	7.4
	O2 ppm	7.8	9.3	9.6	9.4	9.4
	Cond.	900				800
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.2	7.5	7.4	7.4
	O2 ppm	8.1	9.4	9.9	9.6	9.8
	Cond.	890				800
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.8	7.7
	O2 ppm	10.0	9.8	10.2	10.4	10.4
	Cond.	167				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.7	7.7
	O2 ppm	10.0	10.2	9.8	9.6	9.8
	Cond.	169				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890275

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : J.Longlade
Date Collected : 11/28/89
Received : 11/29/89
Tested : 11/30/89 at: 1030

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME								TOTAL MORTALITY	
%	00:00	01:10	01:00	02:00	04:00	25:10	49:10	76:10	96:00	%
100	0	0	0	0	0	0	0	0	2	20
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890275

TEST CONC. %		ELAPSED TIME 00:00	01:10	01:00	02:00	04:00	25:10	49:10	76:10	96:0
100	pH	6.9	7.2				7.6	7.6	7.6	7.
	O2 ppm	8.6	9.5				10.1	10.1	9.9	10.
	Cond.	840	840				820	800	790	80
	Temp(C)	14.0	14.0				14.0	14.0	14.0	15.
65	pH		7.3				7.8	7.7	7.8	7.
	O2 ppm		9.8				10.3	10.2	10.2	10.
	Cond.		640				620	610	590	62
	Temp(C)		14.0				14.0	14.0	14.0	15.
40	pH		7.5				7.8	7.8	7.8	7.
	O2 ppm		9.9				10.4	10.2	10.2	10.
	Cond.		490				490	480	480	49
	Temp(C)		14.0				14.0	14.0	14.0	15.
30	pH		7.5				7.7	7.7	7.7	7.
	O2 ppm		10.0				10.4	10.1	10.0	10.
	Cond.		440				430	420	420	43
	Temp(C)		14.0				14.0	14.0	14.0	15.
20	pH		7.6				7.7	7.7	7.7	7.
	O2 ppm		10.0				10.2	10.1	10.0	10.
	Cond.		375				370	360	360	37
	Temp(C)		14.0				14.0	14.0	14.0	15.
10	pH		7.7				7.8	7.7	7.8	7.
	O2 ppm		10.1				10.3	10.2	10.1	10.
	Cond.		300				290	310	300	31
	Temp(C)		14.0				14.0	14.0	14.0	15.
Control	pH		7.8				7.9	7.6	7.4	7.
	O2 ppm		10.1				10.3	10.3	10.2	10.
	Cond.		260				255	240	240	25
	Temp(C)		14.0				14.0	14.0	14.0	15.

MISA - Trout

TOXICITY TEST REPORT Sample: 05890064

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-SEP. 11&12, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/23/89 at: 1300

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	29:00	53:00	70:00	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890064

TEST CONC. %		ELAPSED TIME 00:00	29:00	53:00	70:00	96:00
100	pH	8.1	7.3	7.4	7.3	7.3
	O2 ppm	8.8	8.2	8.5	9.1	8.1
	Cond.	182				191
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.9	7.3	7.4	7.3	7.3
	O2 ppm	9.4	8.2	8.4	9.1	7.8
	Cond.	180				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.2	7.4	7.3	7.3
	O2 ppm	9.4	8.0	8.8	8.3	6.6
	Cond.	178				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.4	7.2	7.3	7.3	7.3
	O2 ppm	9.4	7.8	9.2	9.0	7.0
	Cond.	172				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.1	7.2	7.3	7.4	7.4
	O2 ppm	9.4	8.2	8.3	9.0	7.9
	Cond.	170				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.0	7.2	7.4	7.5	7.5
	O2 ppm	9.8	8.6	8.3	9.4	8.7
	Cond.	168				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.4	7.2
	O2 ppm	9.4	8.5	8.2	7.8	7.8
	Cond.	168				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.4	7.3
	O2 ppm	9.6	8.2	8.5	8.4	7.6
	Cond.	168				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890117

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-SEP. 11&12, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1620

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	19:20	45:20	72:20	97:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890117

TEST CONC. %		ELAPSED TIME 00:00	19:20	45:20	72:20	97:10
100	pH	8.2	7.8	7.9	7.8	7.7
	O2 ppm	9.5	10.0	9.6	10.2	9.8
	Cond.	175				174
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.8	7.8	7.9	7.8	7.7
	O2 ppm	9.8	10.5	9.7	10.1	9.6
	Cond.	173				171
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.5	7.8	7.9	7.7	7.7
	O2 ppm	9.9	10.6	9.6	10.2	7.5
	Cond.	173				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.8	7.9	7.8	7.7
	O2 ppm	10.2	10.4	9.6	10.4	9.6
	Cond.	172				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.1	7.7	7.8	7.7	7.6
	O2 ppm	10.2	10.3	9.4	10.3	9.6
	Cond.	172				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.1	7.6	7.8	7.7	7.6
	O2 ppm	10.3	10.1	9.2	10.1	9.8
	Cond.	174				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.5	7.8	7.7	7.7
	O2 ppm	9.7	10.2	9.8	10.2	10.2
	Cond.	170				171
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.6	7.8	7.8	7.7
	O2 ppm	9.9	10.3	10.4	10.4	10.4
	Cond.	171				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890063

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.9, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/23/89 at: 1300

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	29:00	54:00	70:00	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890063

TEST CONC. %		ELAPSED TIME 00:00	29:00	54:00	70:00	96:00
100	pH	7.8	7.2	7.2	7.2	7.2
	O2 ppm	8.8	7.5	8.2	8.4	8.0
	Cond.	450				468
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.5	7.2	7.2	7.3	7.2
	O2 ppm	9.0	6.9	8.4	7.6	7.6
	Cond.	378				398
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.2	7.2	7.3	7.2
	O2 ppm	9.2	7.9	9.2	8.4	8.0
	Cond.	322				350
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.0	7.2	7.2	7.4	7.3
	O2 ppm	9.4	7.5	8.6	8.9	8.0
	Cond.	231				258
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.0	7.2	7.2	7.4	7.3
	O2 ppm	9.4	7.9	8.9	9.1	8.3
	Cond.	189				212
	Temp(C)		15.0	15.0	15.0	15.0
1	pH	7.0	7.3	7.3	7.4	7.3
	O2 ppm	9.4	8.8	8.9	9.1	8.2
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.4	7.2
	O2 ppm	9.4	8.5	8.2	7.8	7.8
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.4	7.3
	O2 ppm	9.6	8.2	8.5	8.4	7.6
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890116

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.9, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1820

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	02:00	17:20	45:20	70:20	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890116

TEST CONC. %		ELAPSED TIME 02:00	17:20	45:20	70:20	95:10
100	pH	7.9	7.8	7.9	7.9	7.8
	O2 ppm	10.2	10.1	10.1	10.2	9.9
	Cond.	172				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.8	7.8	8.0	7.8
	O2 ppm	10.3	10.2	9.7	9.9	10.0
	Cond.	171				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.5	7.8	7.8	8.0	7.8
	O2 ppm	10.4	10.0	9.6	10.0	10.0
	Cond.	170				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.4	7.7	7.8	8.0	7.7
	O2 ppm	10.3	0.8	9.5	9.8	10.0
	Cond.	170				165
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.7	7.8	7.9	7.8
	O2 ppm	10.4	9.9	9.6	10.0	10.0
	Cond.	168				165
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.1	7.8	7.7	7.7	7.7
	O2 ppm	10.3	9.9	9.6	9.6	9.9
	Cond.	167				165
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.5	7.7	7.7	7.7
	O2 ppm	9.7	10.2	9.8	10.2	10.2
	Cond.	170				171
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.6	7.9	7.8	7.7
	O2 ppm	9.9	10.3	9.8	10.4	10.4
	Cond.	171				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 05890065

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.3, (600)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/23/89 at: 1300

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	29:00	53:00	70:00	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890065

TEST CONC. %		ELAPSED TIME 00:00	29:00	53:00	70:00	96:00
100	pH	7.6	7.3	7.4	7.3	7.4
	O2 ppm	9.3	8.0	8.9	9.0	8.1
	Cond.	172				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.3	7.4	7.3	7.4
	O2 ppm	9.6	8.2	8.4	9.1	8.0
	Cond.	172				181
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.2	7.4	7.3	7.3
	O2 ppm	9.6	8.0	9.1	9.2	8.3
	Cond.	170				183
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.2	7.2	7.4	7.3	7.3
	O2 ppm	9.5	8.1	8.9	8.6	8.3
	Cond.	168				185
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.1	7.2	7.4	7.3	7.3
	O2 ppm	9.6	8.1	8.1	8.6	8.2
	Cond.	168				185
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.1	7.2	7.4	7.3	7.3
	O2 ppm	10.0	7.6	8.0	8.5	8.2
	Cond.	168				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.4	7.2
	O2 ppm	9.4	8.5	8.2	7.8	7.8
	Cond.	168				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.4	7.3
	O2 ppm	9.6	8.2	8.5	8.4	7.6
	Cond.	168				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0

HISA - Trout

TOXICITY TEST REPORT Sample: 05890118

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.3, (600)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1620

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:20	47:20	72:20	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890118

TEST CONC. %		ELAPSED TIME 00:00	19:20	47:20	72:20	97:10
100	pH	7.9	7.8	7.9	7.7	7.8
	O2 ppm	11.0	10.4	9.8	10.5	10.3
	Cond.	165				165
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.8	7.7	7.7
	O2 ppm	10.8	10.1	9.6	10.6	10.2
	Cond.	168				165
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.5	7.6	7.8	7.7	7.7
	O2 ppm	10.6	9.6	9.3	9.9	9.8
	Cond.	169				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.6	7.9	7.7	7.7
	O2 ppm	10.5	10.1	9.6	9.0	9.9
	Cond.	170				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.3	7.6	7.8	7.7	7.7
	O2 ppm	10.3	9.9	9.4	9.5	9.9
	Cond.	170				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.1	7.7	7.8	7.8	7.7
	O2 ppm	10.4	10.0	9.8	9.8	10.0
	Cond.	170				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.5	7.7	7.7	7.7
	O2 ppm	9.7	10.2	9.8	10.2	10.2
	Cond.	170				171
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.6	7.9	7.8	7.7
	O2 ppm	9.9	10.3	9.8	10.4	10.4
	Cond.	171				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Esso Petroleum Canada, Sarnia (70102)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
Data for twelve Daphnia magna acute lethality toxicity tests conducted on effluent samples collected between June and November 1989 were provided by Esso Petroleum Canada - Sarnia Refinery. Six samples of process effluent were non-lethal to Daphnia. One sample of process effluent tested in the M.O.E. laboratory in November was also non-lethal.

One of two samples from CW-Sep. 11 & 12, and two samples from each of CW-Sep. 9 and CW-Sep. 3 were all not acutely lethal to Daphnia.

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intake water

process effluent

05890044 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890050 sampled: 07/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890060 sampled: 08/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890070 sampled: 09/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890072 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890094 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890275 sampled: 11/28/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

CW-SEP. 11&12

05890064 sampled: 08/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890117 sampled: 11/21/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.9

05890063 sampled: 08/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890116 sampled: 11/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.3

05890065 sampled: 08/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890118 sampled: 11/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890044

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/06/89 at: 930

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	49:25	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890044

TEST CONC. %		ELAPSED TIME 00:00	49:25
100	pH	7.3	7.5
	O2 ppm	8.6	8.6
	Cond.	670	720
	Temp(C)	20.0	20.0
50	pH	7.7	7.7
	O2 ppm	9.4	8.4
	Cond.	600	600
	Temp(C)	20.0	20.0
26	pH	8.0	7.8
	O2 ppm	9.5	8.4
	Cond.	520	520
	Temp(C)	20.0	20.0
13	pH	8.1	7.8
	O2 ppm	9.4	8.5
	Cond.	500	500
	Temp(C)	20.0	20.0
6	pH	8.1	7.9
	O2 ppm	9.4	8.7
	Cond.	500	500
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.4	9.0
	Cond.	500	480
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890050

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/03/89
Received : 07/03/89
Tested : 07/04/89 at: 1005

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:15	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890050

TEST CONC. %		ELAPSED TIME 00:00	48:15
100	pH	7.3	7.4
	O2 ppm	8.4	8.7
	Cond.	680	680
	Temp(C)	20.0	20.0
50	pH	7.7	7.7
	O2 ppm	9.0	9.1
	Cond.	580	580
	Temp(C)	20.0	20.0
26	pH	7.9	7.8
	O2 ppm	9.0	9.2
	Cond.	520	510
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.1	9.3
	Cond.	500	500
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	9.1	9.4
	Cond.	500	500
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.6	9.4
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890060

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/14/89
Received : 08/14/89
Tested : 08/14/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890060

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.3	7.5
	O2 ppm	7.2	8.2
	Cond.	740	720
	Temp(C)	20.0	20.0
50	pH	7.7	7.7
	O2 ppm	8.2	8.4
	Cond.	620	610
	Temp(C)	20.0	20.0
26	pH	7.8	7.8
	O2 ppm	8.5	8.6
	Cond.	580	570
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	8.8	8.5
	Cond.	520	520
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	8.8	9.0
	Cond.	520	510
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.0	9.2
	Cond.	494	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890070

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 09/11/89
Received : 09/11/89
Tested : 09/12/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890070

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.4	7.5
	O2 ppm	8.6	8.4
	Cond.	680	750
	Temp(C)	20.0	20.0
50	pH	7.7	7.7
	O2 ppm	9.3	8.8
	Cond.	540	600
	Temp(C)	20.0	20.0
26	pH	7.8	7.8
	O2 ppm	9.4	9.2
	Cond.	480	520
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.6	9.2
	Cond.	500	500
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	9.8	9.4
	Cond.	480	510
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	10.0	9.4
	Cond.	468	492
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890072

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/02/89 at: 1615

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:05	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890072

TEST CONC. %		ELAPSED TIME 00:00	48:05
100	pH	7.4	7.7
	O2 ppm	7.5	8.9
	Cond.	550	530
	Temp(C)	20.0	20.0
50	pH	7.8	7.9
	O2 ppm	8.3	9.0
	Cond.	520	510
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.4	9.0
	Cond.	510	500
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	8.4	9.0
	Cond.	500	500
	Temp(C)	20.0	20.0
6	pH	8.1	8.1
	O2 ppm	8.4	8.9
	Cond.	500	500
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.1	9.2
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890094

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1610

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890094

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.3	7.6
	O2 ppm	8.0	8.2
	Cond.	910	880
	Temp(C)	20.0	20.0
50	pH	7.5	7.7
	O2 ppm	8.4	8.4
	Cond.	680	640
	Temp(C)	20.0	20.0
26	pH	7.7	7.8
	O2 ppm	8.8	8.6
	Cond.	550	520
	Temp(C)	20.0	20.0
13	pH	7.7	7.8
	O2 ppm	8.8	8.6
	Cond.	462	478
	Temp(C)	20.0	20.0
6	pH	7.7	7.8
	O2 ppm	8.9	8.6
	Cond.	440	442
	Temp(C)	20.0	20.0
Control	pH	7.7	7.9
	O2 ppm	9.4	8.7
	Cond.	400	410
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890275

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : J. Langlade
Date Collected : 11/28/89
Received : 11/29/89
Tested : 11/29/89 at: 1317

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:38	48:38	72:38	%
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890275

TEST CONC. %		ELAPSED TIME 00:00	01:38	48:38	72:38
100	pH	6.9			7.5
	O2 ppm	8.0			7.7
	Cond.	980			998
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	7.2			7.8
	O2 ppm	8.5			8.2
	Cond.	716			698
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	7.7			7.9
	O2 ppm	8.9			8.2
	Cond.	512			513
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	7.8			8.0
	O2 ppm	9.1			8.3
	Cond.	404			409
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	7.8			8.1
	O2 ppm	9.1			8.3
	Cond.	344			337
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	7.8			8.0
	O2 ppm	9.3			8.4
	Cond.	315			303
	Temp(C)	20.0	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890064

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-SEP. 11&12, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/22/89 at: 1700

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890064

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	8.1	7.9
	O2 ppm	8.8	9.0
	Cond.	190	200
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	9.0	9.1
	Cond.	344	340
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	9.0	9.3
	Cond.	414	405
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.0	9.2
	Cond.	418	422
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.0	9.3
	Cond.	470	460
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.2	9.2
	Cond.	480	482
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890117

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-SEP. 11&12, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1435

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	49:20	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890117

TEST CONC. %		ELAPSED TIME 00:00	49:20
100	pH	8.0	8.0
	O2 ppm	9.3	9.3
	Cond.	218	218
	Temp(C)	20.0	20.0
50	pH	8.0	8.0
	O2 ppm	8.8	8.8
	Cond.	370	370
	Temp(C)	20.0	20.0
26	pH	8.1	8.1
	O2 ppm	8.7	8.7
	Cond.	435	435
	Temp(C)	20.0	20.0
13	pH	8.1	8.1
	O2 ppm	8.8	8.8
	Cond.	470	470
	Temp(C)	20.0	20.0
6	pH	8.1	8.1
	O2 ppm	9.0	9.0
	Cond.	495	495
	Temp(C)	20.0	20.0
Control	pH	8.1	8.1
	O2 ppm	9.0	9.0
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890063

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.9, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/23/89 at: 1605

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:10	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890063

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.9	7.7
	O2 ppm	9.2	8.4
	Cond.	470	480
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	9.2	8.4
	Cond.	480	488
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.2	8.4
	Cond.	490	490
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	9.2	8.8
	Cond.	490	495
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.2	9.2
	Cond.	480	492
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	10.2	9.0
	Cond.	482	492
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890116

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.9, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1515

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:15	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890116

TEST CONC.		ELAPSED TIME 00:00	48:15
%			
100	pH	8.3	8.0
	O2 ppm	9.4	8.6
	Cond.	194	229
	Temp(C)	20.0	20.0
50	pH	8.2	8.1
	O2 ppm	9.4	8.8
	Cond.	352	376
	Temp(C)	20.0	20.0
26	pH	8.2	8.1
	O2 ppm	9.4	8.9
	Cond.	430	441
	Temp(C)	20.0	20.0
13	pH	8.2	8.1
	O2 ppm	9.4	9.0
	Cond.	468	478
	Temp(C)	20.0	20.0
6	pH	8.1	8.1
	O2 ppm	9.7	8.8
	Cond.	488	498
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	9.8	9.1
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890065

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.3, (600)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/23/89 at: 1640

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890065

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.8	7.9
	O2 ppm	9.2	9.0
	Cond.	186	186
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	9.1	9.1
	Cond.	350	341
	Temp(C)	20.0	20.0
26	pH	7.9	8.0
	O2 ppm	9.1	9.1
	Cond.	428	410
	Temp(C)	20.0	20.0
13	pH	7.9	8.0
	O2 ppm	9.2	9.2
	Cond.	466	440
	Temp(C)	20.0	20.0
6	pH	7.9	8.0
	O2 ppm	9.4	9.2
	Cond.	470	468
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.5	9.2
	Cond.	480	484
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890118

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.3, (600)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1415

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:05	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890118

TEST CONC. %		ELAPSED TIME 00:00	48:05
100	pH	7.9	8.0
	O2 ppm	10.4	9.5
	Cond.	190	212
	Temp(C)	20.0	20.0
50	pH	8.1	8.1
	O2 ppm	9.6	8.8
	Cond.	360	338
	Temp(C)	20.0	20.0
26	pH	8.2	8.1
	O2 ppm	9.4	8.9
	Cond.	438	437
	Temp(C)	20.0	20.0
13	pH	8.2	8.2
	O2 ppm	9.4	9.0
	Cond.	470	460
	Temp(C)	20.0	20.0
6	pH	8.2	8.2
	O2 ppm	9.4	8.8
	Cond.	482	500
	Temp(C)	20.0	20.0
Control	pH	8.1	8.2
	O2 ppm	9.8	9.0
	Cond.	500	520
	Temp(C)	20.0	20.0

COMPANY: NOVA Petrochemicals Inc.(Corunna), Sarnia (480004)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six acute lethality trout bioassays, conducted on process effluent samples collected between June and November 1989 were provided by NOVA Petrochemicals Inc. (Corunna) (formerly Petrosar Ltd.). All six process effluent samples were determined to have been not acutely lethal to test fish.

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intake water

Process Effluent

05890045 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890116 sampled: 06/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample

05890051 sampled: 07/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890062 sampled: 08/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890068 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890080 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890098 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890293 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA aduit sample.

NOVA Petrochemicals Inc.(Corunna) (continued)

storm water

landfarm leachate

emergency overflow

MISA - Trout

TOXICITY TEST REPORT Sample: 05890045

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/06/89 at: 1200

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME							TOTAL MORTALITY
%	00:00	21:30	22:30	46:15	71:00	74:30	97:00	%
100	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0
6			0		0			0
Control			0		0			0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890045

TEST CONC. %		ELAPSED TIME 00:00	21:30	22:30	46:15	71:00	74:30	97:00
100	pH	7.1	7.3	7.4	7.4	7.5		7.3
	O2 ppm	9.2	8.8	9.4	9.0	8.1		9.5
	Cond.	1680		1800		1860		1650
	Temp(C)	15.0	15.0	20.0	15.0	20.0	15.0	15.0
100	pH	7.2	7.3	7.8	7.4	7.7		7.3
	O2 ppm	8.8	8.8	9.4	9.0	8.4		9.6
	Cond.	1660		1120		1180		1630
	Temp(C)	15.0	15.0	20.0	15.0	20.0	15.0	15.0
Control	pH	6.9	7.4	7.9	7.4	7.9	7.4	7.3
	O2 ppm	10.2	8.8	9.2	9.0	8.5	9.4	9.4
	Cond.	168		820		840		168
	Temp(C)	15.0	15.0	20.0	15.0	20.0	15.0	15.0
Control	pH	6.9	7.3	8.0	7.4	8.0	7.4	7.3
	O2 ppm	10.4	8.8	9.4	9.1	8.5	9.4	9.4
	Cond.	168		620		680		178
	Temp(C)	15.0	15.0	20.0	15.0	20.0	15.0	15.0
6	pH			8.0		8.0		
	O2 ppm			9.2		8.7		
	Cond.			520		580		
	Temp(C)			20.0		20.0		
Control	pH			8.0		8.0		
	O2 ppm			9.8		8.6		
	Cond.			480		490		
	Temp(C)			20.0		20.0		

MISA - Trout

TOXICITY TEST REPORT Sample: 01890116

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 06/14/89
Received : 06/14/89
Tested : 06/15/89 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	01:10	23:15	48:10	72:00	96:00	%
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890116

TEST CONC. %		ELAPSED TIME 00:00	01:10	23:15	48:10	72:00	96:00
100	pH	7.1	7.6	7.8	7.9	8.1	7.7
	O2 ppm	7.3	8.9	9.1	8.7	8.8	9.4
	Cond.	2100	2100	2000	2000	2000	2000
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH		7.7	7.9	7.9	8.2	7.6
	O2 ppm		9.1	9.1	8.8	8.9	8.5
	Cond.		1440	1440	1410	1445	1400
	Temp(C)		15.0	15.0	15.0	15.0	15.0
40	pH		7.7	8.0	7.9	8.3	7.9
	O2 ppm		9.4	9.2	8.9	8.9	9.4
	Cond.		1000	1010	1000	1020	1000
	Temp(C)		15.0	15.0	15.0	15.0	15.0
30	pH		7.7	7.9	7.8	8.2	7.9
	O2 ppm		9.4	9.2	8.8	8.9	9.6
	Cond.		800	820	800	825	800
	Temp(C)		15.0	15.0	15.0	15.0	15.0
20	pH		7.7	7.8	7.8	8.3	7.8
	O2 ppm		9.5	9.2	8.8	8.8	9.5
	Cond.		630	630	660	660	640
	Temp(C)		15.0	15.0	15.0	15.0	15.0
10	pH		7.5	7.5	8.0	8.2	7.6
	O2 ppm		9.4	9.1	8.7	8.7	9.5
	Cond.		450	465	460	465	450
	Temp(C)		15.0	15.0	15.0	15.0	15.0
Control	pH		7.1	7.0	7.9	7.8	7.1
	O2 ppm		9.5	9.1	8.7	8.7	9.4
	Cond.		270	275	280	290	275
	Temp(C)		15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890051

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/03/89
Received : 07/03/89
Tested : 07/04/89 at: 1445

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:55	47:55	74:55	96:25	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890051

TEST CONC.		ELAPSED TIME				
%		00:00	19:55	47:55	74:55	96:25
100	pH	7.1	7.3	7.5	7.6	7.6
	O2 ppm	8.2	8.2	9.6	9.4	9.4
	Cond.	1900				1980
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.3	7.5	7.6	7.6
	O2 ppm	8.0	7.6	9.6	9.5	9.8
	Cond.	1880				1930
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.4	7.3	7.5	7.4
	O2 ppm	9.8	8.4	9.6	9.5	9.6
	Cond.	174				186
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.5	7.3	7.5	7.4
	O2 ppm	9.6	8.4	8.4	9.2	9.4
	Cond.	172				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890062

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/14/89
Received : 08/14/89
Tested : 08/15/89 at: 1200

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	21:00	45:00	69:00	96:00	TOTAL MORTALITY
%						%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits .: 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890062

TEST CONC. %		ELAPSED TIME 00:00	21:00	45:00	69:00	96:00
100	pH	7.3	7.4	7.4	7.5	7.5
	O2 ppm	8.4	9.2	8.9	9.0	8.9
	Cond.	2000				1950
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.4	7.4	7.5	7.5
	O2 ppm	8.4	9.2	9.0	9.1	9.1
	Cond.	2000				1950
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.4
	O2 ppm	9.8	9.8	9.4	9.6	9.6
	Cond.	170				177
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.4
	O2 ppm	9.6	9.4	9.2	9.4	9.4
	Cond.	170				177
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890068

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	47:00	72:00	96:20	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890068

TEST CONC. %		ELAPSED TIME 00:00	19:00	47:00	72:00	96:20
100	pH	7.7	7.5	7.4	7.3	7.3
	O2 ppm	9.0	8.7	8.0	7.8	
	Cond.	1160				1160
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.7	7.6	7.4	7.3	7.2
	O2 ppm	9.0	8.0	7.9	7.4	
	Cond.	1160				1160
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.0	7.2	7.2	7.2
	O2 ppm	10.2	9.2	8.4	8.3	8.2
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.0	7.2	7.2	7.2
	O2 ppm	10.2	9.0	8.5	8.6	8.4
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890080

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:10	44:00	70:10	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890080

TEST CONC. %		ELAPSED TIME 00:00	19:10	44:00	70:10	96:00
100	pH	7.4	7.4	7.2	7.4	7.3
	O2 ppm	8.6	7.4	7.2	7.2	7.0
	Cond.	1100				1060
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	7.4	7.3	7.4	7.3
	O2 ppm	8.6	7.3	7.4	6.4	6.6
	Cond.	1100				1040
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.2	7.4	7.4	7.4
	O2 ppm	10.1	8.9	8.6	8.3	8.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.1	7.3	7.3	7.3
	O2 ppm	10.0	9.2	8.8	8.7	8.2
	Cond.	173				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890098

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1800

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:30	40:00	64:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890098

TEST CONC.		ELAPSED TIME				
%		00:00	22:30	40:00	64:00	96:00
100	pH	7.0	7.1	7.5	7.4	7.4
	O2 ppm	8.8	9.5	9.8	9.8	10.0
	Cond.	2210				2000
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.0	7.0	7.3	7.3	7.4
	O2 ppm	8.8	8.6	8.9	8.9	10.1
	Cond.	2210				2040
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.7	7.7
	O2 ppm	10.0	9.8	10.2	9.8	10.3
	Cond.	167				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.7	7.7
	O2 ppm	10.0	10.2	9.8	9.8	9.8
	Cond.	169				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890293

TEST CONDITIONS

Company : NOVA Petrochemicals Inc.(Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : S. Natha
Date Collected : 12/13/89
Received : 12/14/89
Tested : 12/15/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	00:30	01:00	02:00	04:00	23:00	48:00	69:00	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA aduit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890293

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	23:00	48:00	69:00	96:0
100	pH	7.0	7.6				7.9	7.9	7.9	7.
	O2 ppm	6.9	10.8				11.0	10.7	10.0	10.
	Cond.	2500	2350				2350	2350	2400	240
	Temp(C)	14.0	14.0				14.0	14.0	14.0	14.
65	pH		7.7				7.9	7.8	7.9	7.
	O2 ppm		10.9				10.9	10.7	10.1	10.
	Cond.		1650				1650	1600	1650	165
	Temp(C)		14.0				14.0	14.0	14.0	14.
40	pH		7.8				7.9	7.8	7.9	7.
	O2 ppm		10.9				11.0	10.7	10.0	10.
	Cond.		1160				1140	1145	1140	116
	Temp(C)		14.0				14.0	14.0	14.0	14.
30	pH		7.8				7.9	7.8	7.9	7.
	O2 ppm		10.7				11.0	10.7	10.2	10.
	Cond.		900				920	940	900	96
	Temp(C)		14.0				14.0	14.0	14.0	14.
20	pH		7.8				7.9	7.8	7.9	7.
	O2 ppm		10.8				11.0	10.7	10.1	10.
	Cond.		680				690	700	720	72
	Temp(C)		14.0				14.0	14.0	14.0	14.
10	pH		7.9				8.0	7.9	7.9	7.
	O2 ppm		11.0				11.1	10.8	10.2	10.
	Cond.		500				495	500	540	54
	Temp(C)		14.0				14.0	14.0	14.0	14.
Control	pH		7.9				7.9	7.8	7.9	7.
	O2 ppm		10.9				11.1	10.7	9.9	10.
	Cond.		250				240	240	260	26
	Temp(C)		14.0				14.0	14.0	14.0	14.

COMPANY: NOVA Petrochemicals Inc. (Corunna), Sarnia (480004)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
Data for six Daphnia magna acute lethality toxicity tests conducted on samples of process effluent collected between June and November 1989 were submitted by NOVA Petrochemicals Inc.(Corunna) (formerly Petrosar Ltd.). Five of six samples were not acutely lethal to Daphnia. One process effluent sample tested in the M.O.E. laboratory in July had a LC50 >100%. Only one animal died in samples collected in July and November.

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intake water

Process Effluent

05890045 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890116 sampled: 06/14/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

05890051 sampled: 07/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890062 sampled: 08/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890068 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890080 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890098 sampled: 11/06/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

storm water

landfarm leachate

emergency overflow

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890045

TEST CONDITIONS

Company : NOVA Petrochemicals Inc. (Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/07/89 at: 1030

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	49:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890045

TEST CONC. %		ELAPSED TIME 00:00	49:10
100	pH	7.4	7.5
	O2 ppm	9.4	8.1
	Cond.	1800	1860
	Temp(C)	20.0	20.0
50	pH	7.8	7.7
	O2 ppm	9.4	8.4
	Cond.	1120	1180
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.2	8.5
	Cond.	820	840
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.4	8.5
	Cond.	620	680
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.2	8.7
	Cond.	520	580
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.8	8.6
	Cond.	480	490
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890116

TEST CONDITIONS

Company : NOVA Petrochemicals Inc. (Corunna)
Sarnia, ONT
(480004)
Region : SouthWest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 06/14/89
Received : 06/15/89
Tested : 06/15/89 at: 1135

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	1	8
15	0	0	0	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890116

TEST CONC. %		ELAPSED TIME 00:00	01:00	24:00	48:00
100	pH	7.4			7.6
	O2 ppm	8.4			7.8
	Cond.	2180			2160
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	7.8			7.9
	O2 ppm	8.5			7.8
	Cond.	1440			1430
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.1			8.0
	O2 ppm	8.5			7.8
	Cond.	849			845
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	8.2			8.1
	O2 ppm	8.5			7.8
	Cond.	587			591
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.3			8.1
	O2 ppm	8.5			7.8
	Cond.	402			408
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.3			7.9
	O2 ppm	8.4			7.8
	Cond.	296			317
	Temp(C)	20.0	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890051

TEST CONDITIONS

Company : NOVA Petrochemicals Inc. (Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/03/89
Received : 07/03/89
Tested : 07/06/89 at: 1000

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	51:30	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890051

TEST CONC.		ELAPSED TIME 00:00	51:30
%			
100	pH	7.4	7.5
	O2 ppm	8.9	8.4
	Cond.	2180	2140
	Temp(C)	20.0	20.0
50	pH	7.7	7.7
	O2 ppm	9.0	8.7
	Cond.	1340	1340
	Temp(C)	20.0	20.0
26	pH	7.9	7.8
	O2 ppm	9.0	8.9
	Cond.	920	900
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.1	9.0
	Cond.	700	700
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	9.1	9.0
	Cond.	580	580
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.6	9.1
	Cond.	500	480
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890062

TEST CONDITIONS

Company : NOVA Petrochemicals Inc. (Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/14/89
Received : 08/14/89
Tested : 08/14/89 at: 1545

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890062

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.5	7.6
	O2 ppm	7.5	8.7
	Cond.	2320	2220
	Temp(C)	20.0	20.0
50	pH	7.8	7.7
	O2 ppm	8.3	8.9
	Cond.	1400	1340
	Temp(C)	20.0	20.0
26	pH	7.8	7.8
	O2 ppm	8.4	9.0
	Cond.	960	950
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	8.6	9.2
	Cond.	720	730
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	8.7	9.2
	Cond.	520	520
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.0	9.2
	Cond.	494	498
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890068

TEST CONDITIONS

Company : NOVA Petrochemicals Inc. (Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1150

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890068

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.6	7.7
	O2 ppm	8.8	8.8
	Cond.	1200	1200
	Temp(C)	20.0	20.0
50	pH	7.6	7.7
	O2 ppm	8.6	8.9
	Cond.	800	880
	Temp(C)	20.0	20.0
26	pH	7.5	7.7
	O2 ppm	8.3	9.0
	Cond.	680	695
	Temp(C)	20.0	20.0
13	pH	7.4	7.7
	O2 ppm	8.2	9.2
	Cond.	580	600
	Temp(C)	20.0	20.0
6	pH	7.5	7.7
	O2 ppm	8.2	9.1
	Cond.	500	510
	Temp(C)	20.0	20.0
Control	pH	7.3	7.6
	O2 ppm	8.4	9.1
	Cond.	470	480
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890080

TEST CONDITIONS

Company : NOVA Petrochemicals Inc. (Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/02/89 at: 1600

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890080

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.7	7.6
	O2 ppm	8.7	8.1
	Cond.	1200	1150
	Temp(C)	20.0	20.0
50	pH	8.0	7.8
	O2 ppm	8.7	8.4
	Cond.	870	820
	Temp(C)	20.0	20.0
26	pH	8.1	7.8
	O2 ppm	8.8	8.4
	Cond.	700	700
	Temp(C)	20.0	20.0
13	pH	8.1	7.9
	O2 ppm	8.7	9.0
	Cond.	600	600
	Temp(C)	20.0	20.0
6	pH	8.1	7.9
	O2 ppm	8.7	9.0
	Cond.	515	525
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.1	9.2
	Cond.	500	510
	Temp(C)	20.0	20.0

TOXICITY TEST REPORT Sample: 05890098

TEST CONDITIONS

Company : NOVA Petrochemicals Inc. (Corunna)
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1045

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	49:15	TOTAL MORTALITY
%			%
100	0	0	0
50	0	1	8
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890098

TEST CONC. %		ELAPSED TIME 00:00	49:15
100	pH	7.2	7.5
	O2 ppm	9.0	8.2
	Cond.	2300	2200
	Temp(C)	20.0	20.0
50	pH	7.5	7.7
	O2 ppm	9.2	8.4
	Cond.	1360	1080
	Temp(C)	20.0	20.0
26	pH	7.7	7.8
	O2 ppm	9.2	8.5
	Cond.	900	880
	Temp(C)	20.0	20.0
13	pH	7.8	7.9
	O2 ppm	9.2	8.6
	Cond.	640	640
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.2	8.6
	Cond.	500	500
	Temp(C)	20.0	20.0
Control	pH	7.9	8.0
	O2 ppm	9.4	8.7
	Cond.	400	400
	Temp(C)	20.0	20.0

COMPANY: Petro-Canada Inc., Mississauga (130104)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY
The data for six acute lethality trout bioassays conducted on process effluent samples collected between June and November 1989 were provided by Petro-Canada Inc., Lake Ontario Refinery - Mississauga Plant. All six process effluent samples were determined to have been not acutely lethal to test fish. Toxicity tests were also conducted on three samples from each of the two cooling water trap sampling locations. All six samples were not acutely lethal to rainbow trout.

Process Effluent

0689316 sampled: 06/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

0689434 sampled: 07/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: No mortality or sublethal impairment observed

01890153 sampled: 07/19/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

0689600 sampled: 08/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06890894 sampled: 09/20/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06890986 sampled: 10/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06891071 sampled: 11/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

storm water

cooling water-trap 1

01890154 sampled: 07/19/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample

0689615 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06891067 sampled: 11/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

cooling water-trap 3

01890155 sampled: 07/19/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

0689617 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT NOTED

06891069 sampled: 11/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

intake water

TOXICITY TEST REPORT Sample: 0689316

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 06/12/89
Received : 06/12/89
Tested : 06/12/89 at: 1930

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 0689316

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.2	8.0	8.0	7.9	8.2
	O2 ppm	8.4	8.1	8.0	7.5	9.6
	Cond.	710				725
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.8	8.0	8.0	8.0
	O2 ppm	8.3	8.0	8.1	8.6	9.3
	Cond.	714				729
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	8.2	8.1	8.1	8.1
	O2 ppm	10.0	9.5	8.3	7.8	9.0
	Cond.	401				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	8.2	8.2	8.1	8.1
	O2 ppm	10.2	9.6	9.5	9.0	8.7
	Cond.	362				393
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 0689434

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : Grab
Sampled By : Karen Gregory
Date Collected : 07/10/89
Received : 07/10/89
Tested : 07/10/89 at: 1630

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : No mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : Moving Average

TOXICITY TEST PARAMETERS

Sample Number: 0689434

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.4	8.2	8.2	8.2	8.2
	O2 ppm	7.6	9.6	9.5	9.7	9.6
	Cond.	745				767
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	8.1	8.3	8.2	8.3
	O2 ppm	7.6	9.7	9.6	9.6	9.4
	Cond.	750				735
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.2	8.2	8.1	8.2
	O2 ppm	9.4	9.9	9.8	9.9	9.0
	Cond.	393				393
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	8.0	8.1	8.2	8.3
	O2 ppm	9.2	9.8	9.5	9.7	9.4
	Cond.	395				396
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890153

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : MOE
Sampling Method : grab
Sampled By : R. Gibson
Date Collected : 07/19/89
Received : 07/20/89
Tested : 07/20/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	00:30	01:00	02:00	04:00	24:00	47:30	72:00	96:00	%
100	0	0	0	0	0	0	0	1	1	10
65	0	0	0	0	0	0	0	1	1	10
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890153

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	24:00	47:30	72:00	96:0
100	pH	7.8	7.8				7.6	7.6	7.5	7.
	O2 ppm	5.6	9.4				6.7	9.5	9.5	9.
	Cond.	435	400				500	470	480	48
	Temp(C)	15.0	15.0				15.0	15.0	15.0	15.
65	pH		7.7				7.6	7.6	7.5	7.
	O2 ppm		9.8				7.0	9.6	9.5	9.
	Cond.		385				420	395	390	40
	Temp(C)		15.0				15.0	15.0	15.0	15.
40	pH		7.7				7.5	7.5	7.3	7.
	O2 ppm		9.6				6.9	9.6	9.7	9.
	Cond.		325				350	340	325	35
	Temp(C)		15.0				15.0	15.0	15.0	15.
30	pH		7.6				7.4	7.4	7.3	7.
	O2 ppm		9.5				6.9	9.6	9.6	9.
	Cond.		305				335	335	305	32
	Temp(C)		15.0				15.0	15.0	15.0	15.
20	pH		7.6				7.1	7.4	7.3	7.
	O2 ppm		9.6				6.8	9.5	9.5	9.
	Cond.		285				310	285	295	30
	Temp(C)		15.0				15.0	15.0	15.0	15.
10	pH		7.6				6.9	7.3	7.2	7.
	O2 ppm		9.1				6.4	9.2	9.2	9.
	Cond.		280				285	275	280	28
	Temp(C)		15.0				15.0	15.0	15.0	15.
Control	pH		7.8				7.8	7.6	7.4	7.
	O2 ppm		9.4				9.3	9.3	9.3	9.
	Cond.		265				265	260	260	26
	Temp(C)		15.0				15.0	15.0	15.0	15.

MISA - Trout

TOXICITY TEST REPORT Sample: 0689600

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KAREN GREGORY
Date Collected : 08/01/89
Received : 08/01/89
Tested : 08/01/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 0689600

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.4	8.2	8.2	8.2	8.2
	O2 ppm	7.2	9.6	9.5	9.6	9.6
	Cond.	654				648
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	8.1	8.1	8.2	8.1
	O2 ppm	7.5	9.7	9.6	9.7	9.6
	Cond.	645				648
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	8.1	8.1	8.1	8.1
	O2 ppm	9.8	9.8	9.8	9.8	9.7
	Cond.	371				369
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.1	8.1	8.1	8.1
	O2 ppm	9.8	9.9	9.8	9.7	9.6
	Cond.	362				364
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890894

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 09/20/89
Received : 09/20/89
Tested : 09/20/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890894

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.7	7.8	7.7	8.1	8.2
	O2 ppm	8.0	9.3	9.3	9.6	9.6
	Cond.	748				657
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.8	7.8	7.8	8.0	8.2
	O2 ppm	8.3	9.5	9.2	9.6	9.6
	Cond.	574				521
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.9	8.0	8.0	8.1	8.2
	O2 ppm	8.6	9.6	9.4	9.6	9.7
	Cond.	541				982
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.9	8.0	8.0	8.1	8.2
	O2 ppm	8.5	9.1	9.6	9.4	9.6
	Cond.	466				421
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	7.9	7.9	8.0	8.1
	O2 ppm	8.6	9.4	9.5	9.7	9.5
	Cond.	425				399
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	7.9	8.0	8.0	8.2
	O2 ppm	8.7	9.2	9.4	9.6	9.5
	Cond.	385				371
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	8.0	8.0	8.1	8.2
	O2 ppm	9.3	9.4	9.5	9.5	9.7
	Cond.	330				338
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890986

TEST CONDITIONS

Company	: Petro-Canada Inc. Mississauga, ONT (130104)
Region	: Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (100)
Laboratory	: BEAK
Sampling Method	: GRAB
Sampled By	: A. BALDASSARRA
Date Collected	: 10/10/89
Received	: 10/10/89
Tested	: 10/10/89 at: 1730
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890986

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
100	pH	7.5	7.9	8.1	7.9	8.0
	O2 ppm	8.1	9.3	8.4	9.2	8.7
	Cond.	895				839
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	7.8	8.0	8.0	7.9
	O2 ppm	7.9	9.2	9.8	9.3	8.4
	Cond.	877				826
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.5	7.8	7.9	7.9	7.9
	O2 ppm	8.3	8.7	9.2	8.7	9.5
	Cond.	374				358
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.9	7.8	7.9	8.0
	O2 ppm	9.3	8.9	8.4	8.9	9.2
	Cond.	347				348
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06891071

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 11/14/89
Received : 11/14/89
Tested : 11/14/89 at: 1630

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
Control	0	0	0	0	0	0
10	0	0	0	0	0	0
20	0	0	0	0	0	0
30	0	0	0	0	0	0
50	0	0	0	0	0	0
65	0	0	0	0	0	0
100	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891071

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
Control	pH	7.5	8.0	8.0	8.0	8.0
	O2 ppm	8.3	8.7	8.8	9.0	8.0
	Cond.	338				325
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	8.2	8.1	8.0	7.9
	O2 ppm	9.2	8.6	8.3	10.2	9.2
	Cond.	379				416
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	8.2	8.2	8.0	7.9
	O2 ppm	9.3	9.5	8.8	9.9	9.2
	Cond.	415				420
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.8	8.0	8.2	8.1	8.0
	O2 ppm	8.9	8.8	9.3	9.8	9.3
	Cond.	452				450
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.7	8.2	8.2	7.9	7.9
	O2 ppm	8.9	9.3	9.3	9.5	9.4
	Cond.	521				491
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.5	7.8	8.0	7.9	7.9
	O2 ppm	8.2	8.9	8.9	9.7	9.5
	Cond.	566				551
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.6	8.2	8.2	8.0	7.9
	O2 ppm	8.7	8.8	8.9	9.3	9.5
	Cond.	673				634
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890154

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : R. Gibson
Date Collected : 07/19/89
Received : 07/19/89
Tested : 07/20/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME							TOTAL MORTALITY		
%	00:00	00:30	01:00	02:00	04:00	24:00	47:15	71:45	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	1	1	10
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890154

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	24:00	47:15	71:45	96:0
100	pH	9.2	7.6				7.6	7.3	7.2	7.
	O2 ppm	9.9	10.2				6.3	9.4	9.3	9.
	Cond.	355	245				265	245	265	25
	Temp(C)	15.0	15.0				15.0	15.0	15.0	15.
65	pH		7.5				7.6	7.3	7.2	7.
	O2 ppm		9.7				6.3	9.6	9.5	9.
	Cond.		230				265	240	260	25
	Temp(C)		15.0				15.0	15.0	15.0	15.
40	pH		7.5				7.6	7.3	7.1	7.
	O2 ppm		9.6				6.4	9.6	9.5	9.
	Cond.		255				265	245	260	25
	Temp(C)		15.0				15.0	15.0	15.0	15.
30	pH		7.5				7.6	7.3	7.1	7.
	O2 ppm		9.5				6.4	9.4	9.2	9.
	Cond.		255				265	260	250	25
	Temp(C)		15.0				15.0	15.0	15.0	15.
20	pH		7.5				7.6	7.3	7.0	7.
	O2 ppm		9.5				6.6	9.4	9.4	9.
	Cond.		240				265	260	255	25
	Temp(C)		15.0				15.0	15.0	15.0	15.
10	pH		7.4				7.6	7.2	7.0	7.
	O2 ppm		9.5				6.8	9.6	9.4	9.
	Cond.		250				265	250	250	24
	Temp(C)		15.0				15.0	15.0	15.0	15.
Control	pH		7.8				7.8	7.6	7.4	7.
	O2 ppm		9.4				9.3	9.3	9.3	9.
	Cond.		265				265	260	260	26
	Temp(C)		15.0				15.0	15.0	15.0	15.

MISA - Trout

TOXICITY TEST REPORT Sample: 0689615

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KAREN GREGORY
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/08/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 0689615

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.1	8.1	8.0	8.2	8.2
	O2 ppm	9.6	7.8	8.8	8.6	7.8
	Cond.	374				380
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.9	7.9	7.9	8.0	8.0
	O2 ppm	8.6	8.1	7.4	8.2	7.4
	Cond.	375				381
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.9	8.1	8.1	8.0	8.1
	O2 ppm	8.4	8.3	7.8	7.6	8.3
	Cond.	376				383
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.9	8.1	8.1	8.2	8.1
	O2 ppm	8.3	8.3	8.4	7.8	8.5
	Cond.	377				391
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	7.9	8.0	8.1	8.0
	O2 ppm	8.6	8.5	7.9	8.3	8.3
	Cond.	374				389
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	8.1	8.1	8.0	8.1
	O2 ppm	8.4	8.3	7.9	7.9	9.0
	Cond.	364				379
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.1	8.0	8.1	8.0
	O2 ppm	8.4	8.0	8.0	7.8	7.9
	Cond.	351				390
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06891067

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 11/14/89
Received : 11/14/89
Tested : 11/14/89 at: 1630

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
Control	0	0	0	0	0	0
10	0	0	0	0	0	0
20	0	0	0	0	0	0
30	0	0	0	0	0	0
50	0	0	0	0	0	0
65	0	0	0	0	0	0
100	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891067

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
Control	pH	7.5	8.0	8.0	8.0	8.0
	O2 ppm	8.3	8.7	8.8	9.0	8.0
	Cond.	338				325
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	8.1	8.2	8.2	8.1
	O2 ppm	9.3	9.3	8.8	10.1	7.9
	Cond.	363				426
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.7	8.2	8.3	8.2	8.1
	O2 ppm	9.0	8.8	8.5	10.1	9.7
	Cond.	355				361
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.8	8.2	8.2	8.2	8.1
	O2 ppm	8.9	9.2	9.3	10.0	9.5
	Cond.	351				350
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.8	8.2	8.3	8.1	8.1
	O2 ppm	9.3	9.2	8.6	10.2	9.6
	Cond.	349				348
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.8	8.0	8.1	8.1	8.1
	O2 ppm	9.3	8.3	8.5	10.2	9.3
	Cond.	349				340
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.9	8.1	8.2	8.1	8.1
	O2 ppm	9.0	9.0	9.1	10.0	8.9
	Cond.	347				333
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 01890155

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : MOE
Sampling Method : grab
Sampled By : R. Gibson
Date Collected : 07/19/89
Received : 07/20/89
Tested : 07/20/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	00:30	01:00	02:00	04:00	23:45	47:00	71:20	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	1	1	10
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	1	1	1	10
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890155

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	23:45	47:00	71:20	96:0
100	pH	8.7	7.8				7.6	7.3	7.1	7.
	O2 ppm	10.0	9.9				9.9	9.5	9.5	9.
	Cond.	225	290				315	300	310	32
	Temp(C)	15.0	15.0				15.0	15.0	15.0	15.
65	pH		7.8				7.6	7.2	7.1	7.
	O2 ppm		9.8				9.7	9.3	9.4	9.
	Cond.		280				300	295	275	29
	Temp(C)		15.0				15.0	15.0	15.0	15.
40	pH		7.8				7.6	7.3	7.1	7.
	O2 ppm		9.7				9.8	9.5	9.5	9.
	Cond.		260				285	265	275	26
	Temp(C)		15.0				15.0	15.0	15.0	15.
30	pH		7.8				7.6	7.2	7.0	7.
	O2 ppm		9.4				9.6	9.3	9.4	9.
	Cond.		260				275	260	265	27
	Temp(C)		15.0				15.0	15.0	15.0	15.
20	pH		7.8				7.5	7.2	7.0	7.
	O2 ppm		9.5				9.4	9.4	9.5	9.
	Cond.		255				270	250	255	27
	Temp(C)		15.0				15.0	15.0	15.0	15.
10	pH		7.7				7.6	7.1	6.8	7.
	O2 ppm		9.2				9.5	9.5	9.4	9.
	Cond.		260				275	245	255	26
	Temp(C)		15.0				15.0	15.0	15.0	15.
Control	pH		7.8				7.8	7.6	7.4	7.
	O2 ppm		9.4				9.3	9.3	9.3	9.
	Cond.		265				265	260	260	26
	Temp(C)		15.0				15.0	15.0	15.0	15.

MISA - Trout

TOXICITY TEST REPORT Sample: 0689617

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KAREN GREGORY
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/08/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	1	1	10
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT NOTED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 0689617

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
100	pH	8.9	8.1	8.1	8.1	8.1
	O2 ppm	9.2	9.3	8.4	8.2	9.3
	Cond.	532				532
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	8.5	8.1	8.0	8.1	8.1
	O2 ppm	8.2	8.5	7.5	8.2	8.8
	Cond.	485				476
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.4	8.1	8.1	8.2	8.2
	O2 ppm	8.4	8.8	9.1	8.3	9.3
	Cond.	458				451
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.2	8.0	8.0	8.0	8.0
	O2 ppm	8.7	8.5	8.4	8.8	7.9
	Cond.	427				425
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	8.0	8.2	8.1	8.3	8.2
	O2 ppm	9.1	9.2	8.7	8.7	8.8
	Cond.	405				404
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.9	8.2	8.2	8.2	8.1
	O2 ppm	8.2	9.4	8.7	8.6	8.7
	Cond.	378				384
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.1	8.0	8.1	8.0
	O2 ppm	8.4	8.0	8.0	7.8	7.9
	Cond.	351				390
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06891069

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 11/14/89
Received : 11/14/89
Tested : 11/14/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
Control	0	0	0	0	0	0
10	0	0	0	0	0	0
20	0	0	0	0	0	0
30	0	0	0	0	0	0
50	0	0	0	0	0	0
65	0	0	0	0	0	0
100	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891069

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
Control	pH	7.5	8.0	8.0	8.0	8.0
	O2 ppm	8.3	8.7	8.8	9.0	8.0
	Cond.	338				325
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	8.2	8.2	8.1	8.1
	O2 ppm	9.3	8.8	8.8	9.4	8.6
	Cond.	353				344
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	8.0	8.3	8.1	8.1
	O2 ppm	8.9	8.6	8.9	9.7	9.5
	Cond.	365				355
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.0	8.2	8.3	8.2	8.1
	O2 ppm	9.4	9.2	8.7	9.7	9.7
	Cond.	371				360
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.2	8.1	8.2	8.1	8.1
	O2 ppm	8.8	8.7	8.9	8.9	9.6
	Cond.	383				368
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	8.4	8.2	8.2	8.1	8.1
	O2 ppm	9.0	8.3	8.6	8.7	9.7
	Cond.	395				379
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	8.7	8.5	8.2	8.1	8.1
	O2 ppm	8.8	8.3	8.5	9.4	9.7
	Cond.	412				402
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Petro-Canada Inc., Mississauga (130104)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY
Data for ten Daphnia magna acute lethality toxicity tests conducted on effluent samples collected between June and November 1989 were submitted by Petro-Canada Inc., Lake Ontario Refinery - Mississauga Plant. Five of six samples were not acutely lethal to Daphnia. One sample collected in September had a 48 h LC50 of 97 %. One process effluent sample tested in the M.O.E. laboratory in July was non-lethal.

One of two samples from cooling water-trap 1 was non-lethal. The second sample had a 48 h LC50 >100 %. An audit sample tested in the M.O.E. laboratory in July had an LC50 >100 %.

Two samples of effluent from cooling water-trap 3 were both not acutely lethal to Daphnia. An audit sample tested in the M.O.E. laboratory in July had an LC50 >100 %, with the greatest number of mortalities occuring in the 15 % effluent concentration.

Process Effluent

0689317 sampled: 06/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 hrs

0689435 sampled: 07/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

02890153 sampled: 07/19/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit floaters within 24 hrs/recovered

0689601 sampled: 08/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: No mortality or immobility observed in 48hrs.

06890895 sampled: 09/20/89 LC50: 97.0 %
95% fid. limits: 84.0 - 100.0 %
comments: 70% mortality in full strenght eff.observed

06890987 sampled: 10/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06891072 sampled: 11/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

storm water

cooling water-trap 1

02890154 sampled: 07/19/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit/immobility within 24 hrs.

0689616 sampled: 08/08/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% mortality in full strength effluent

06891068 sampled: 11/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

cooling water-trap 3

02891155 sampled: 07/19/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit/many floaters:EC50 = 20.2

0689618 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 90% IMMOBILITY OBSERVED IN 48 HOURS.

06891070 sampled: 11/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: SOME OF THE DAPHNIDS WERE FLOATING IN TST SOL

intake water

MISA - Daphnia

TOXICITY TEST REPORT Sample: 0689317

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 06/12/89
Received : 06/12/89
Tested : 06/12/89 at: 1630

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxjcity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving

TOXICITY TEST PARAMETERS

Sample Number: 0689317

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.6		8.1
	O2 ppm	7.0		7.2
	Cond.	659		659
	Temp(C)	20.0	20.0	20.0
50	pH	7.9		8.2
	O2 ppm	7.5		7.9
	Cond.	510		508
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.2
	O2 ppm	7.8		7.9
	Cond.	464		456
	Temp(C)	20.0	20.0	20.0
20	pH	8.2		8.2
	O2 ppm	7.8		8.0
	Cond.	440		434
	Temp(C)	20.0	20.0	20.0
10	pH	8.3		8.3
	O2 ppm	7.8		8.4
	Cond.	410		394
	Temp(C)	20.0	20.0	20.0
Control	pH	8.3		8.2
	O2 ppm	8.1		8.1
	Cond.	336		335
	Temp(C)	20.0	20.0	20.0

TOXICITY TEST REPORT Sample: 0689435

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : Grab
Sampled By : Karen Gregory
Date Collected : 07/10/89
Received : 07/10/89
Tested : 07/10/89 at: 1800

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : Moving Average

TOXICITY TEST PARAMETERS

Sample Number: 0689435

TEST CONC.		ELAPSED TIME 00:00	24:00	48:00
%				
100	pH	7.7		7.9
	O2 ppm	8.3		6.9
	Cond.	692		695
	Temp(C)		20.0	20.0
65	pH	7.7		8.0
	O2 ppm	8.4		8.5
	Cond.	593		581
	Temp(C)		20.0	20.0
50	pH	7.8		8.1
	O2 ppm	8.4		8.4
	Cond.	533		515
	Temp(C)		20.0	20.0
30	pH	8.0		8.2
	O2 ppm	8.4		8.3
	Cond.	474		450
	Temp(C)		20.0	20.0
20	pH	8.0		8.2
	O2 ppm	8.5		8.5
	Cond.	439		410
	Temp(C)		20.0	20.0
10	pH	8.1		8.3
	O2 ppm	8.3		8.5
	Cond.	414		364
	Temp(C)		20.0	20.0
Control	pH	8.1		8.2
	O2 ppm	8.3		8.5
	Cond.	325		340
	Temp(C)		20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890153

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : MOE
Sampling Method : grab
Sampled By : Raeburn&Gibson
Date Collected : 07/19/89
Received : 07/20/89
Tested : 07/20/89 at: 1200

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	4	0	0
60	0	0	1	0	0
30	0	0	4	0	0
15	0	0	2	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit floaters within 24 hrs/recovered

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890153

TEST CONC. %		ELAPSED TIME 00:00	01:00	24:00	48:00
100	pH	7.5			7.7
	O2 ppm	9.2			8.2
	Cond.	604			553
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	7.9			7.7
	O2 ppm	9.1			8.2
	Cond.	460			452
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.0			7.8
	O2 ppm	8.7			8.2
	Cond.	381			376
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	8.2			7.8
	O2 ppm	9.0			8.2
	Cond.	343			335
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.2			7.8
	O2 ppm	8.9			8.2
	Cond.	316			311
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.3			7.9
	O2 ppm	8.8			8.2
	Cond.	300			263
	Temp(C)	20.0	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 0689601

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KAREN GREGORY
Date Collected : 08/01/89
Received : 08/01/89
Tested : 08/01/89 at: 1346

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : No mortality or immobility observed in 48hrs.

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 0689601

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	7.5		7.6
	O2 ppm	6.5		7.5
	Cond.	660		620
	Temp(C)	20.0	20.0	20.0
65	pH	7.8		7.7
	O2 ppm	7.6		7.9
	Cond.	536		528
	Temp(C)	20.0	20.0	20.0
50	pH	8.0		7.7
	O2 ppm	8.0		8.3
	Cond.	510		490
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		7.8
	O2 ppm	8.3		8.2
	Cond.	445		447
	Temp(C)	20.0	20.0	20.0
20	pH	8.1		7.8
	O2 ppm	8.4		8.3
	Cond.	429		409
	Temp(C)	20.0	20.0	20.0
10	pH	8.2		7.9
	O2 ppm	8.6		8.2
	Cond.	405		356
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		7.8
	O2 ppm	8.7		8.5
	Cond.	354		333
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890895

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 09/20/89
Received : 09/20/89
Tested : 09/20/89 at: 1700

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	7	70
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : 97.0 %

95% fid. limits : 84.0 - 100.0 %

Comments : 70% mortality in full strenght eff.observed

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890895

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.4		8.0
	O2 ppm	6.9		8.7
	Cond.	699		709
	Temp(C)	20.0	20.0	20.0
65	pH	7.5		8.0
	O2 ppm	7.5		8.1
	Cond.	580		588
	Temp(C)	20.0	20.0	20.0
50	pH	7.6		8.1
	O2 ppm	7.4		7.7
	Cond.	536		542
	Temp(C)	20.0	20.0	20.0
30	pH	7.7		8.1
	O2 ppm	8.1		8.4
	Cond.	459		470
	Temp(C)	20.0	20.0	20.0
20	pH	7.8		8.1
	O2 ppm	8.0		8.5
	Cond.	425		431
	Temp(C)	20.0	20.0	20.0
10	pH	7.9		8.1
	O2 ppm	7.5		7.4
	Cond.	387		405
	Temp(C)	20.0	20.0	20.0
Control	pH	7.9		8.1
	O2 ppm	8.4		8.1
	Cond.	339		365
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890987

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 10/10/89
Received : 10/10/89
Tested : 10/10/89 at: 1800

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890987

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.5		8.1
	O2 ppm	7.4		8.3
	Cond.	760		763
	Temp(C)	20.0	20.0	20.0
65	pH	7.7		8.1
	O2 ppm	7.9		8.4
	Cond.	619		622
	Temp(C)	20.0	20.0	20.0
50	pH	7.8		8.2
	O2 ppm	8.3		8.5
	Cond.	556		558
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.2
	O2 ppm	8.5		8.6
	Cond.	486		489
	Temp(C)	20.0	20.0	20.0
20	pH	8.1		8.2
	O2 ppm	8.5		8.7
	Cond.	447		452
	Temp(C)	20.0	20.0	20.0
10	pH	8.2		8.0
	O2 ppm	8.6		8.7
	Cond.	393		414
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.1
	O2 ppm	8.7		8.5
	Cond.	356		374
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06891072

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 11/14/89
Received : 11/14/89
Tested : 11/14/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY
%				%
Control	0	0	0	0
10	0	0	0	0
20	0	0	0	0
30	0	0	0	0
50	0	0	0	0
65	0	0	0	0
100	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891072

TEST CONC.		ELAPSED TIME 00:00	24:00	48:00
%				
Control	pH	8.1		8.0
	O2 ppm	8.9		8.4
	Cond.	376		363
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.0
	O2 ppm	8.8		8.4
	Cond.	351		384
	Temp(C)	20.0	20.0	20.0
20	pH	7.9		7.9
	O2 ppm	8.7		7.9
	Cond.	401		428
	Temp(C)	20.0	20.0	20.0
30	pH	7.9		7.8
	O2 ppm	8.7		7.4
	Cond.	408		458
	Temp(C)	20.0	20.0	20.0
50	pH	7.6		7.7
	O2 ppm	8.4		6.5
	Cond.	485		517
	Temp(C)	20.0	20.0	20.0
65	pH	7.5		7.6
	O2 ppm	8.0		5.5
	Cond.	546		576
	Temp(C)	20.0	20.0	20.0
100	pH	7.3		7.5
	O2 ppm	7.5		4.9
	Cond.	622		662
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890154

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : Raeburn&Gibson
Date Collected : 07/19/89
Received : 07/20/89
Tested : 07/20/89 at: 1130

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	0	2	16
60	0	0	1	3	25
30	0	0	2	4	33
15	0	0	1	0	0
5	0	0	2	2	16
Control	0	0	2	1	8

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit/immobility within 24 hrs.

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890154

TEST CONC.		ELAPSED TIME			
%		00:00	01:00	24:00	48:00
100	pH	8.2			8.1
	O2 ppm	9.2			7.2
	Cond.	328			296
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	8.2			8.1
	O2 ppm	8.8			7.3
	Cond.	312			275
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.3			8.1
	O2 ppm	8.5			7.3
	Cond.	309			302
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	8.3			8.1
	O2 ppm	8.5			7.2
	Cond.	307			302
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.3			8.1
	O2 ppm	8.3			7.2
	Cond.	305			299
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.3			8.2
	O2 ppm	8.4			7.3
	Cond.	301			269
	Temp(C)	20.0	20.0	20.0	20.0

NISA - Daphnia

TOXICITY TEST REPORT Sample: 0689616

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KAREN GREGORY
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/09/89 at: 1200

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	2	20
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : 20% mortality in full strength effluent

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 0689616

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	7.9		8.2
	O2 ppm	10.6		8.5
	Cond.	346		365
	Temp(C)	20.0	20.0	20.0
65	pH	8.0		8.2
	O2 ppm	10.0		8.5
	Cond.	349		363
	Temp(C)	20.0	20.0	20.0
50	pH	8.0		8.2
	O2 ppm	9.7		8.6
	Cond.	344		360
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.2
	O2 ppm	9.5		8.7
	Cond.	351		358
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.2
	O2 ppm	9.2		8.6
	Cond.	350		354
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.2
	O2 ppm	8.9		8.6
	Cond.	337		333
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.1
	O2 ppm	8.9		8.5
	Cond.	332		320
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06891068

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 11/14/89
Received : 11/14/89
Tested : 11/14/89 at: 1430

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
Control	0	0	0	0
10	0	0	0	0
20	0	0	0	0
30	0	0	0	0
50	0	0	0	0
65	0	0	0	0
100	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891068

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
Control	pH	8.1		8.0
	O2 ppm	8.9		8.4
	Cond.	376		365
	Temp(C)	20.0	20.0	20.0
10	pH	8.2		8.0
	O2 ppm	8.9		8.1
	Cond.	360		375
	Temp(C)	20.0	20.0	20.0
20	pH	8.2		8.1
	O2 ppm	9.4		8.4
	Cond.	357		375
	Temp(C)	20.0	20.0	20.0
30	pH	8.1		8.1
	O2 ppm	9.5		8.6
	Cond.	353		375
	Temp(C)	20.0	20.0	20.0
50	pH	8.1		8.1
	O2 ppm	9.8		8.7
	Cond.	348		374
	Temp(C)	20.0	20.0	20.0
65	pH	8.1		8.1
	O2 ppm	9.9		8.7
	Cond.	341		393
	Temp(C)	20.0	20.0	20.0
100	pH	8.0		8.1
	O2 ppm	10.3		8.7
	Cond.	333		390
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02891155

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : MOE
Sampling Method : grab
Sampled By : R. Gibson
Date Collected : 07/19/89
Received : 07/20/89
Tested : 07/24/89 at: 1125

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	8	0	0
60	0	0	9	0	0
30	0	0	8	2	16
15	0	0	0	6	50
5	0	0	2	2	16
Control	0	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit/many floaters:EC50 = 20.2

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02891155

TEST CONC.		ELAPSED TIME			
%		00:00	01:00	24:00	48:00
100	pH	8.5			8.1
	O2 ppm	8.4			8.0
	Cond.	362			368
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	8.4			8.1
	O2 ppm	8.6			8.0
	Cond.	338			343
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.4			8.0
	O2 ppm	8.6			7.9
	Cond.	321			321
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	8.3			8.0
	O2 ppm	8.6			8.0
	Cond.	309			311
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.3			7.9
	O2 ppm	8.6			8.0
	Cond.	304			298
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.3			7.9
	O2 ppm	8.7			7.9
	Cond.	297			299
	Temp(C)	20.0	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 0689618

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KAREN GREGORY
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/09/89 at: 1200

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : 90% IMMOBILITY OBSERVED IN 48 HOURS.

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 0689618

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	8.4		8.3
	O2 ppm	10.5		8.4
	Cond.	488		490
	Temp(C)	20.0	20.0	20.0
65	pH	8.3		8.2
	O2 ppm	10.2		8.3
	Cond.	444		448
	Temp(C)	20.0	20.0	20.0
50	pH	8.3		8.2
	O2 ppm	9.7		8.4
	Cond.	422		425
	Temp(C)	20.0	20.0	20.0
30	pH	8.2		8.2
	O2 ppm	9.4		8.3
	Cond.	396		399
	Temp(C)	20.0	20.0	20.0
20	pH	8.2		8.2
	O2 ppm	9.3		8.4
	Cond.	375		385
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.2
	O2 ppm	9.4		8.5
	Cond.	353		360
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.1
	O2 ppm	8.9		8.5
	Cond.	323		320
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06891070

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : A. BALDASSARRA
Date Collected : 11/14/89
Received : 11/14/89
Tested : 11/14/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
Control	0	0	0	0
10	0	0	0	0
20	0	0	0	0
30	0	0	0	0
50	0	0	0	0
65	0	0	0	0
100	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : SOME OF THE DAPHNIDS WERE FLOATING IN TST SOL

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891070

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
Control	pH	8.1		8.0
	O2 ppm	8.9		8.5
	Cond.	376		365
	Temp(C)	20.0	20.0	20.0
10	pH	8.2		8.1
	O2 ppm	9.2		8.4
	Cond.	324		375
	Temp(C)	20.0	20.0	20.0
20	pH	8.3		8.2
	O2 ppm	9.4		8.5
	Cond.	327		385
	Temp(C)	20.0	20.0	20.0
30	pH	8.4		8.2
	O2 ppm	9.5		8.6
	Cond.	341		387
	Temp(C)	20.0	20.0	20.0
50	pH	8.5		8.3
	O2 ppm	9.7		8.7
	Cond.	350		415
	Temp(C)	20.0	20.0	20.0
65	pH	8.6		8.3
	O2 ppm	9.8		8.7
	Cond.	377		418
	Temp(C)	20.0	20.0	20.0
100	pH	8.7		8.4
	O2 ppm	10.3		8.5
	Cond.	389		457
	Temp(C)	20.0	20.0	20.0

COMPANY: Petro-Canada Inc., Oakville (530006)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY
The data for six acute lethality trout bioassays, conducted on process effluent samples collected between June and November 1989 were provided by Petro-Canada Inc., Lake Ontario Refinery - Oakville Plant. One of the process effluent samples was determined to have been acutely lethal to test fish. Statistically, the percentage effluent required to kill 50 % of the test fish by the end of the four days exposure was 80.6 % (June). The other five samples were determined to have been not acutely lethal.

Process Effluent

06890314 sampled: 06/12/89 LC50: 80.6 %
95% fid. limits: 66.1 - 98.2 %
comments: 80% MORTALITY IN FULL STRENGTH EFFLUENT

06890432 sampled: 07/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06890682 sampled: 08/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06890838 sampled: 09/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06890984 sampled: 10/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06891094 sampled: 11/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06891254 sampled: 12/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EO-sheet pond

intake water

storm water

MISA - Trout

TOXICITY TEST REPORT Sample: 06890314

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : STEVEN MO
Date Collected : 06/12/89
Received : 06/12/89
Tested : 06/12/89 at: 1930

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	72:00	96:00	TOTAL MORTALITY %
100	0	5	8	8	8	80
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : 80.6 %

95% fid. limits : 66.1 - 98.2 %

Comments : 80% MORTALITY IN FULL STRENGTH EFFLUENT

SLOPE of Mortality Curve :
LC50 Calculated By : TRIMMED SPEARMAN KARBER

TOXICITY TEST PARAMETERS

Sample Number: 06890314

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.4	8.5	8.5	8.4	8.4
	O2 ppm	9.6	8.7	8.2	9.7	9.5
	Cond.	2480				2470
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.3	8.4	8.4	8.3	8.3
	O2 ppm	9.4	9.0	8.9	9.6	9.5
	Cond.	1714				1754
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.3	8.2	8.2	8.1	8.1
	O2 ppm	10.0	9.2	9.0	9.1	9.1
	Cond.	1369				1327
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.3	8.2	8.3	8.2	8.2
	O2 ppm	10.0	9.0	9.1	9.0	9.0
	Cond.	972				972
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.2	8.1	8.2	8.1	8.0
	O2 ppm	10.0	9.1	9.2	8.5	8.9
	Cond.	785				820
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.9	7.9	7.9	8.0	8.0
	O2 ppm	9.0	9.0	9.1	9.2	9.0
	Cond.	573				820
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	8.2	8.1	8.1	8.1
	O2 ppm	10.0	9.5	9.3	7.8	9.0
	Cond.	401				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890432

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : STEVEN MO
Date Collected : 07/10/89
Received : 07/10/89
Tested : 07/10/89 at: 1630

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890432

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.0	8.1	8.4	8.3	8.3
	O2 ppm	8.2	9.7	9.8	9.6	9.6
	Cond.	1892				1889
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.9	8.3	8.4	8.4	8.4
	O2 ppm	8.6	9.8	9.7	9.5	9.8
	Cond.	1413				1367
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.8	8.2	8.3	8.3	8.3
	O2 ppm	9.2	9.6	9.6	9.7	9.6
	Cond.	1187				1141
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.7	8.1	8.2	8.2	8.1
	O2 ppm	9.0	9.7	9.3	9.8	9.7
	Cond.	775				854
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.7	8.2	8.2	8.2	8.2
	O2 ppm	9.2	9.8	9.6	9.5	9.8
	Cond.	621				708
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	8.1	8.2	8.1	8.2
	O2 ppm	9.4	9.9	9.4	9.6	9.6
	Cond.	504				581
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	8.0	8.1	8.2	8.3
	O2 ppm	9.2	9.8	9.5	9.7	9.4
	Cond.	395				396
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890682

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : STEVEN MO
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/22/89 at: 1100

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OHE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890682

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.9	8.2	8.3	8.3	8.3
	O2 ppm	7.9	8.9	9.1	9.4	9.2
	Cond.	2540				2410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.9	8.1	8.1	8.2	8.1
	O2 ppm	7.6	8.9	7.9	9.5	9.3
	Cond.	1773				1733
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.0	8.3	8.2	8.1	8.3
	O2 ppm	8.8	9.4	8.9	9.3	9.1
	Cond.	1446				1397
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.0	8.2	8.2	8.2	8.1
	O2 ppm	8.8	8.9	8.8	8.9	8.9
	Cond.	1053				999
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.9	8.1	8.1	8.2	8.1
	O2 ppm	9.4	9.0	8.2	9.1	8.7
	Cond.	823				790
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	8.0	8.2	8.2	8.2
	O2 ppm	9.4	8.2	8.7	9.3	8.8
	Cond.	604				515
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	8.0	8.1	8.1	8.2	7.6
	O2 ppm	9.8	8.6	8.9	9.3	7.6
	Cond.	373				378
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 06890838

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 09/11/89
Received : 09/11/89
Tested : 09/11/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890838

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.7	8.2	8.1	8.4	8.3
	O2 ppm	8.8	9.8	9.2	9.7	9.5
	Cond.	2110				2200
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.7	8.1	8.1	8.3	8.3
	O2 ppm	8.7	9.6	9.2	9.6	9.6
	Cond.	2140				2190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	8.1	7.9	8.1	8.1
	O2 ppm	9.2	9.2	9.2	9.0	9.2
	Cond.	386				379
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	8.1	8.0	8.1	8.2
	O2 ppm	9.8	8.8	9.5	8.0	8.5
	Cond.	387				376
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06890984

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 10/10/89
Received : 10/10/89
Tested : 10/10/89 at: 1730

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890984

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
100	pH	7.5	8.0	8.1	7.8	7.8
	O2 ppm	6.8	9.2	9.2	7.9	8.5
	Cond.	2590				2480
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.5	7.9	8.1	7.8	7.8
	O2 ppm	6.6	8.8	9.5	7.6	8.4
	Cond.	2580				2460
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.5	7.8	7.9	7.9	7.9
	O2 ppm	8.9	8.7	9.2	8.7	9.5
	Cond.	374				358
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.9	7.8	7.9	8.0
	O2 ppm	9.3	8.9	8.4	8.9	9.2
	Cond.	347				348
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06891094

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1300

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0
100	0	0	0	0	0	0
100	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891094

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
Control	pH	8.0	7.9	8.0	8.1	8.2
	O2 ppm	9.0	10.4	9.9	10.0	8.7
	Cond.	358	361			334
	Temp(C)	15.0	14.0	15.0	15.0	15.0
Control	pH	8.0	8.0	8.0	8.1	8.1
	O2 ppm	8.9	9.7	9.7	9.9	8.1
	Cond.	360	356			349
	Temp(C)	15.0	14.0	15.0	15.0	15.0
100	pH	8.3	8.3	8.2	8.2	8.3
	O2 ppm	9.9	10.6	9.9	10.0	9.3
	Cond.	2510	2750			2450
	Temp(C)	15.0	14.0	15.0	15.0	15.0
100	pH	8.3	8.3	8.2	8.2	8.4
	O2 ppm	9.9	10.4	9.9	9.9	9.7
	Cond.	2540	2280			2460
	Temp(C)	15.0	14.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 06891254

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 12/11/89
Received : 12/11/89
Tested : 12/11/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
Control	0	0	0	0	0	0
10	0	0	0	0	0	0
20	0	0	0	0	0	0
30	0	0	0	0	0	0
50	0	0	0	0	0	0
65	0	0	0	0	0	0
100	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06891254

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
Control	pH	7.6	8.0	7.9	7.9	7.9
	O2 ppm	8.7	8.7	8.7	8.6	9.3
	Cond.	356				349
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.9	8.1	8.0	7.9	8.0
	O2 ppm	8.8	8.8	8.7	8.4	8.9
	Cond.	614				625
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.9	8.0	8.0	8.0	8.1
	O2 ppm	9.3	9.2	8.8	8.8	9.1
	Cond.	784				804
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.9	8.0	8.0	8.1	8.1
	O2 ppm	9.0	9.0	8.7	8.7	9.3
	Cond.	985				1010
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.9	8.1	8.1	8.2	8.2
	O2 ppm	8.8	8.6	8.8	8.7	9.2
	Cond.	1344				1383
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	7.9	8.1	8.2	8.3	8.3
	O2 ppm	8.6	8.7	9.6	8.3	9.1
	Cond.	1736				1728
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.9	8.0	8.1	8.2	8.1
	O2 ppm	7.2	8.4	8.7	9.1	8.7
	Cond.	2550				2520
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Petro-Canada Inc., Oakville (530006)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY
Data from seven Daphnia magna acute lethality toxicity tests on process effluent samples collected between June and December 1989 were supplied by Petro-Canada Inc., Lake Ontario Refinery - Oakville Plant. Three of seven samples were not acutely lethal to Daphnia. The sample collected in November was the most toxic with a 48 h LC50 of 49.6 %. The samples from August and December had 48 h LC50 values >100 %.

Process Effluent

06890315 sampled: 06/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06890433 sampled: 07/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06890683 sampled: 08/22/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN 65% AND FULL STRENGTH EFF.

06890839 sampled: 09/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48HRS.

06890985 sampled: 10/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06891095 sampled: 11/21/89 LC50: 49.6 %
95% fid. limits: 39.1 - 63.0 % slope: 4.6
comments: 30% MORTALITY IN 30% CONCENTRATION.

06891255 sampled: 12/11/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: DAPHNIDS MORTALITY IN 50,65 & 100% CONC.

EO-sheet pond

intake water

storm water

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890315

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : STEVEN MO
Date Collected : 06/12/89
Received : 06/12/89
Tested : 06/12/89 at: 1700

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890315

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.7		8.5
	O2 ppm	8.7		8.2
	Cond.	2470		2340
	Temp(C)	20.0	20.0	20.0
50	pH	8.6		8.4
	O2 ppm	8.2		8.1
	Cond.	1317		1315
	Temp(C)	20.0	20.0	20.0
30	pH	8.6		8.3
	O2 ppm	8.2		8.1
	Cond.	997		971
	Temp(C)	20.0	20.0	20.0
20	pH	8.5		8.3
	O2 ppm	8.1		8.1
	Cond.	784		782
	Temp(C)	20.0	20.0	20.0
10	pH	8.3		8.2
	O2 ppm	8.0		8.0
	Cond.	587		562
	Temp(C)	20.0	20.0	20.0
Control	pH	8.3		8.2
	O2 ppm	8.1		8.0
	Cond.	356		361
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890433

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : STEVEN MO
Date Collected : 07/10/89
Received : 07/10/89
Tested : 07/10/89 at: 1800

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890433

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	7.7		8.2
	O2 ppm	7.3		7.0
	Cond.	1760		1719
	Temp(C)	20.0	20.0	20.0
65	pH	7.9		8.2
	O2 ppm	7.6		7.4
	Cond.	1338		1269
	Temp(C)	20.0	20.0	20.0
50	pH	7.9		8.2
	O2 ppm	7.8		7.7
	Cond.	1087		1045
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.2
	O2 ppm	8.3		8.1
	Cond.	827		801
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.2
	O2 ppm	8.2		8.2
	Cond.	631		650
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.3
	O2 ppm	8.0		8.3
	Cond.	492		487
	Temp(C)	20.0	20.0	20.0
Control	pH	8.1		8.2
	O2 ppm	8.3		8.5
	Cond.	325		340
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890683

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : STEVEN MO
Date Collected : 08/22/89
Received : 08/22/89
Tested : 08/22/89 at: 1300

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	2	20
65	0	0	2	20
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : 20% MORTALITY IN 65% AND FULL STRENGTH EFF.

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890683

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.6		8.1
	O2 ppm	5.8		7.7
	Cond.	2320		2130
	Temp(C)	20.0	20.0	20.0
65	pH	7.7		8.1
	O2 ppm	7.1		8.0
	Cond.	1662		1547
	Temp(C)	20.0	20.0	20.0
50	pH	7.8		8.1
	O2 ppm	7.7		8.4
	Cond.	1244		1273
	Temp(C)	20.0	20.0	20.0
30	pH	7.8		8.1
	O2 ppm	8.3		8.3
	Cond.	948		902
	Temp(C)	20.0	20.0	20.0
20	pH	7.8		8.1
	O2 ppm	8.5		8.2
	Cond.	750		737
	Temp(C)	20.0	20.0	20.0
10	pH	7.9		8.1
	O2 ppm	8.4		8.4
	Cond.	559		553
	Temp(C)	20.0	20.0	20.0
Control	pH	7.8		8.1
	O2 ppm	8.6		8.4
	Cond.	361		426
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890839

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 09/11/89
Received : 09/11/89
Tested : 09/11/89 at: 1600

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48HRS.

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890839

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.7		8.3
	O2 ppm	7.0		9.1
	Cond.	1984		1900
	Temp(C)	20.0	20.0	20.0
65	pH	7.8		8.3
	O2 ppm	8.1		8.7
	Cond.	1445		1425
	Temp(C)	20.0	20.0	20.0
50	pH	7.9		8.2
	O2 ppm	8.2		8.8
	Cond.	1207		1199
	Temp(C)	20.0	20.0	20.0
30	pH	7.9		8.2
	O2 ppm	8.4		8.3
	Cond.	879		875
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.1
	O2 ppm	8.5		8.4
	Cond.	709		700
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.1
	O2 ppm	8.8		8.4
	Cond.	526		520
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.0
	O2 ppm	8.7		8.5
	Cond.	346		339
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06890985

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 10/10/89
Received : 10/10/89
Tested : 10/10/89 at: 1820

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
65	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SLOPE of Mortality Curve :
LC50 Calculated By : MOVING AVERAGE

TOXICITY TEST PARAMETERS

Sample Number: 06890985

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.5		7.9
	O2 ppm	4.6		4.8
	Cond.	2380		2370
	Temp(C)	20.0	20.0	20.0
65	pH	7.7		8.0
	O2 ppm	6.4		6.6
	Cond.	1696		1680
	Temp(C)	20.0	20.0	20.0
50	pH	7.8		8.0
	O2 ppm	6.8		7.0
	Cond.	1379		1364
	Temp(C)	20.0	20.0	20.0
30	pH	7.9		8.1
	O2 ppm	7.8		7.8
	Cond.	980		1001
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.1
	O2 ppm	8.0		8.0
	Cond.	804		799
	Temp(C)	20.0	20.0	20.0
10	pH	8.2		8.2
	O2 ppm	8.4		8.4
	Cond.	598		584
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.1
	O2 ppm	8.7		8.5
	Cond.	356		374
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06891095

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 11/21/89
Received : 11/21/89
Tested : 11/21/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
Control	0	0	0	0
10	0	0	0	0
20	0	0	0	0
30	0	0	3	30
50	0	0	4	40
65	0	0	6	60
100	0	0	10	100

48 Hour LC50 : 49.6 %

95% fid. limits : 39.1 - 63.0 %

Comments : 30% MORTALITY IN 30% CONCENTRATION.

SLOPE of Mortality Curve : 4.6
LC50 Calculated By : PROBIT

TOXICITY TEST PARAMETERS

Sample Number: 06891095

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
Control	pH	8.1		8.2
	O2 ppm	9.1		8.9
	Cond.	361		398
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.3
	O2 ppm	8.8		8.8
	Cond.	579		520
	Temp(C)	20.0	20.0	20.0
20	pH	8.2		8.3
	O2 ppm	8.9		9.0
	Cond.	739		683
	Temp(C)	20.0	20.0	20.0
30	pH	8.2		8.3
	O2 ppm	8.9		9.0
	Cond.	921		892
	Temp(C)	20.0	20.0	20.0
50	pH	8.2		8.3
	O2 ppm	8.8		8.7
	Cond.	1326		1326
	Temp(C)	20.0	20.0	20.0
65	pH	8.2		8.3
	O2 ppm	9.0		8.6
	Cond.	1520		1522
	Temp(C)	20.0	20.0	20.0
100	pH	8.3		8.3
	O2 ppm	8.9		8.5
	Cond.	2070		2130
	Temp(C)	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 06891255

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : GRAB
Sampled By : KEVIN MAURER
Date Collected : 12/11/89
Received : 12/11/89
Tested : 12/11/89 at: 1600

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
Control	0	0	0	0
10	0	0	0	0
20	0	0	0	0
30	0	0	0	0
50	0	0	2	20
65	0	0	3	30
100	0	0	4	40

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : DAPHNIDS MORTALITY IN 50,65 & 100% CONC.

SLOPE of Mortality Curve :
LC50 Calculated By : PROBIT

TOXICITY TEST PARAMETERS

Sample Number: 06891255

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
Control	pH	8.0		8.0
	O2 ppm	8.6		8.4
	Cond.	360		370
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.0
	O2 ppm	8.4		8.3
	Cond.	525		564
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.0
	O2 ppm	8.4		8.0
	Cond.	828		857
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.0
	O2 ppm	8.2		7.6
	Cond.	1027		1048
	Temp(C)	20.0	20.0	20.0
50	pH	7.9		7.9
	O2 ppm	8.0		7.0
	Cond.	1462		1465
	Temp(C)	20.0	20.0	20.0
65	pH	7.9		7.9
	O2 ppm	8.0		6.3
	Cond.	1788		1780
	Temp(C)	20.0	20.0	20.0
100	pH	7.9		7.9
	O2 ppm	6.8		5.9
	Cond.	2540		2660
	Temp(C)	20.0	20.0	20.0

COMPANY: Shell Canada Products Limited, Sarnia (510107)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six acute lethality trout bioassays, conducted on process effluent samples collected between June and November 1989 were provided by Shell Canada Products Ltd. All six process effluent samples were determined to have been not acutely lethal to test fish. Toxicity tests were also conducted on two intake water samples, two cooling water samples discharging to Talford Creek and three cooling water samples from POW. All seven samples were not acutely lethal to rainbow trout.

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intake water

05890055 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890076 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05890049 sampled: 06/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890054 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890061 sampled: 08/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890071 sampled: 09/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890074 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890099 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890292 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

SW to Talford creek

CW to Talford Creek

05890056 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890075 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW from POW

05890057 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890073 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890100 sampled: 11/06/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

EO from storm pond

SW to Baby creek

CW to POW

MISA - Trout

TOXICITY TEST REPORT Sample: 05890055

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:55	49:55	73:55	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890055

TEST CONC. %		ELAPSED TIME 00:00	22:55	49:55	73:55	96:00
100	pH	7.9	7.5	7.5	7.6	7.6
	O2 ppm	10.2	9.6	8.7	9.0	8.9
	Cond.	216				208
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.5	7.4	7.4	7.5
	O2 ppm	10.1	9.3	8.9	9.1	9.0
	Cond.	206				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.5	7.5	7.5	7.6
	O2 ppm	10.2	9.8	8.6	9.3	9.3
	Cond.	198				192
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.5	7.5	7.5	7.6
	O2 ppm	9.8	9.5	8.9	9.2	9.2
	Cond.	182				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.3	7.5	7.4	7.5	7.6
	O2 ppm	9.8	9.6	9.0	9.2	9.2
	Cond.	176				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.4	7.4	7.5	7.6
	O2 ppm	9.9	8.8	8.1	8.9	9.2
	Cond.	172				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.2	7.4	7.3
	O2 ppm	9.8	8.9	8.6	9.2	9.4
	Cond.	172				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.3
	O2 ppm	9.8	8.4	8.2	8.6	9.2
	Cond.	170				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890076

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1515

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:25	44:25	72:25	96:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890076

TEST CONC. %		ELAPSED TIME 00:00	19:25	44:25	72:25	96:15
100	pH	7.7	7.5	7.5	7.5	7.5
	O2 ppm	10.2	9.0	9.0	9.2	9.5
	Cond.	235				236
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.4	7.4	7.4	7.4	7.4
	O2 ppm	10.3	8.6	8.6	8.8	8.8
	Cond.	220				222
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.4	7.4	7.4	7.4
	O2 ppm	10.3	9.2	9.2	9.2	9.2
	Cond.	210				216
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.1	7.4	7.4	7.4	7.4
	O2 ppm	10.0	8.9	8.9	8.9	9.1
	Cond.	187				194
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.0	7.4	7.3	7.4	7.4
	O2 ppm	9.9	8.9	8.9	8.8	9.0
	Cond.	175				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.0	7.4	7.4	7.4	7.4
	O2 ppm	9.9	8.8	8.8	8.7	8.6
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.4	7.4	7.3	7.3
	O2 ppm	9.1	9.1	9.1	9.5	9.2
	Cond.	183				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.5	7.5	7.3	7.3
	O2 ppm	10.1	8.5	8.5	9.0	9.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890049

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/12/89
Received : 06/12/89
Tested : 06/13/89 at: 1415

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	27:25	43:25	69:25	96:15	TOTAL MORTALITY %
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890049

TEST CONC. %		ELAPSED TIME 00:00	27:25	43:25	69:25	96:15
100	pH	7.2	7.8	7.8	7.8	7.8
	O2 ppm	8.6	9.8	9.8	9.3	9.6
	Cond.	640				630
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.8	7.7	7.7	7.6
	O2 ppm	8.6	9.9	9.6	9.2	9.9
	Cond.	620				640
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.3	7.6	7.6	7.5
	O2 ppm	9.6	9.4	9.9	10.0	10.1
	Cond.	170				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.3	7.5	7.5	7.5
	O2 ppm	9.6	9.9	9.8	9.9	10.1
	Cond.	170				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890054

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:55	49:55	73:55	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890054

TEST CONC.		ELAPSED TIME				
%		00:00	22:55	49:55	73:55	96:00
100	pH	7.4	7.7	7.9	7.9	7.9
	O2 ppm	7.3	9.2	8.2	8.9	8.5
	Cond.	580				595
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	7.8	7.9	8.0	8.0
	O2 ppm	7.6	9.2	8.0	8.4	8.2
	Cond.	580				590
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.2	7.4	7.3
	O2 ppm	9.8	8.9	8.6	9.2	9.4
	Cond.	172				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.3
	O2 ppm	9.8	9.2	8.2	8.6	9.2
	Cond.	170				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890061

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/14/89
Received : 09/14/89
Tested : 08/15/89 at: 1200

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:00	45:00	69:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890061

TEST CONC. %		ELAPSED TIME 00:00	21:00	45:00	69:00	96:00
100	pH	7.6	7.7	7.8	7.8	7.8
	O2 ppm	7.8	8.9	8.6	9.2	8.9
	Cond.	680				680
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.6	7.8	7.8	7.7	7.7
	O2 ppm	7.6	9.2	9.0	8.4	8.6
	Cond.	680				680
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.4
	O2 ppm	9.8	9.8	9.4	9.6	9.6
	Cond.	170				177
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.4
	O2 ppm	9.6	9.4	9.2	9.4	9.4
	Cond.	170				177
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890071

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 09/11/89
Received : 09/11/89
Tested : 09/12/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:55	41:00	65:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890071

TEST CONC. %		ELAPSED TIME 00:00	24:55	41:00	65:00	96:00
100	pH	7.3	7.3	7.4	7.3	7.2
	O2 ppm	7.0	8.4	8.0	8.0	7.8
	Cond.	450				420
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.3	7.3	7.3	7.2
	O2 ppm	7.3	8.1	8.4	8.2	7.6
	Cond.	452				421
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.2	7.2
	O2 ppm	9.9	9.2	9.0	7.9	
	Cond.	168				158
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.1	7.1	7.2
	O2 ppm	9.8	9.2	7.6	7.5	9.8
	Cond.	168				158
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890074

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:10	44:00	70:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890074

TEST CONC.		ELAPSED TIME				
%		00:00	19:10	44:00	70:00	96:00
100	pH	7.3	7.4	7.4	7.5	7.5
	O2 ppm	7.1	8.0	8.1	8.2	8.6
	Cond.	498				478
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.3	7.4	7.5	7.5
	O2 ppm	7.4	7.3	7.7	8.6	8.6
	Cond.	500				478
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.2	7.4	7.4	7.4
	O2 ppm	10.1	8.9	8.5	8.7	8.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.1	7.3	7.3	7.3
	O2 ppm	10.0	9.2	8.8	8.7	8.2
	Cond.	173				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890099

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1800

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:00	40:30	64:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890099

TEST CONC.		ELAPSED TIME				
%		00:00	22:00	40:30	64:00	96:00
100	pH	7.3	7.5	7.9	7.9	7.9
	O2 ppm	6.9	8.8	9.3	9.4	9.5
	Cond.	720				690
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	7.5	8.0	8.0	7.9
	O2 ppm	7.0	9.4	9.7	9.6	9.7
	Cond.	720				690
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.8	7.7
	O2 ppm	10.0	9.8	10.2	9.8	10.3
	Cond.	167				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.7	7.7
	O2 ppm	10.0	10.0	9.8	9.8	9.8
	Cond.	169				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890292

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Nethercott
Date Collected : 12/13/89
Received : 12/14/89
Tested : 12/15/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	00:30	01:00	02:00	04:00	24:00	49:00	70:00	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890292

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	24:00	49:00	70:00	96:0
100	pH	7.1		7.6			7.8	7.8	7.9	7.
	O2 ppm	8.6		10.9			10.8	10.7	10.1	9.
	Cond.	640		620			620	620	640	64
	Temp(C)	14.0		14.0			14.0	14.0	14.0	14.
65	pH			7.7			7.9	7.8	7.9	7.
	O2 ppm			10.9			11.0	10.7	10.1	10.
	Cond.			490			480	500	520	49
	Temp(C)			14.0			14.0	14.0	14.0	14.
40	pH			7.8			7.9	7.9	7.9	7.
	O2 ppm			10.8			10.8	10.7	10.1	10.
	Cond.			400			390	400	410	40
	Temp(C)			14.0			14.0	14.0	14.0	14.
30	pH			7.8			7.7	7.9	7.8	7.
	O2 ppm			10.7			10.1	10.4	9.9	9.
	Cond.			360			355	360	375	37
	Temp(C)			14.0			14.0	14.0	14.0	14.
20	pH			7.8			8.0	7.9	8.0	7.
	O2 ppm			10.9			11.1	10.8	10.2	10.
	Cond.			310			320	320	310	32
	Temp(C)			14.0			14.0	14.0	14.0	14.
10	pH			7.9			7.9	7.9	7.9	7.
	O2 ppm			10.8			11.0	10.8	10.1	10.
	Cond.			265			290	290	290	30
	Temp(C)			14.0			14.0	14.0	14.0	14.
Control	pH			7.8			7.9	7.8	7.9	7.
	O2 ppm			10.7			10.9	10.7	9.9	9.
	Cond.			260			230	240	275	25
	Temp(C)			14.0			14.0	14.0	14.0	14.

MISA - Trout

TOXICITY TEST REPORT Sample: 05890056

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:55	49:55	73:55	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890056

TEST CONC. %		ELAPSED TIME 00:00	22:55	49:55	73:55	96:00
100	pH	7.9	7.6	7.6	7.6	7.6
	O2 ppm	9.3	9.5	9.0	9.2	9.2
	Cond.	224				212
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.4	7.5	7.5	7.6
	O2 ppm	9.7	8.7	9.1	8.9	9.0
	Cond.	212				204
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.5	7.5	7.5	7.6
	O2 ppm	9.9	9.3	9.3	9.2	8.9
	Cond.	200				198
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.4	7.5	7.6	7.6
	O2 ppm	10.0	9.3	9.2	9.4	8.9
	Cond.	184				187
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.3	7.4	7.5	7.5	7.5
	O2 ppm	9.9	8.7	9.2	9.6	8.8
	Cond.	178				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.4	7.4	7.5	7.5
	O2 ppm	10.0	8.9	9.2	9.2	9.2
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.2	7.4	7.3
	O2 ppm	9.8	8.9	8.6	9.2	9.4
	Cond.	172				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.3
	O2 ppm	9.8	8.4	8.2	8.6	9.2
	Cond.	170				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890075

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OHE, 1983).

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	19:10	44:00	70:00	96:00	TOTAL MORTALITY
%						%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890075

TEST CONC.		ELAPSED TIME 00:00	19:10	44:00	70:00	96:00
%						
100	pH	7.9	7.6	7.4	7.5	7.5
	O2 ppm	9.5	8.5	9.0	9.2	9.4
	Cond.	248				242
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.5	7.4	7.4	7.4
	O2 ppm	10.0	8.3	8.7	8.8	8.8
	Cond.	230				228
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.5	7.4	7.5	7.4
	O2 ppm	10.0	8.9	9.0	9.6	9.6
	Cond.	210				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.4	7.4	7.4	7.5
	O2 ppm	10.0	8.0	9.2	8.8	9.6
	Cond.	191				196
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.3	7.3	7.4	7.5
	O2 ppm	10.0	9.0	8.8	8.8	9.4
	Cond.	180				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.2	7.3	7.4	7.5	7.5
	O2 ppm	10.1	9.2	9.0	9.4	9.4
	Cond.	175				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.4	7.2	7.3	7.3
	O2 ppm	9.1	9.1	9.2	9.5	9.2
	Cond.	183				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.5	7.3	7.3	7.2
	O2 ppm	10.1	8.5	8.5	9.0	9.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890057

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:55	49:55	73:55	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890057

TEST CONC. %		ELAPSED TIME 00:00	22:55	49:55	73:55	96:00
100	pH	7.9	7.6	7.6	7.6	7.7
	O2 ppm	9.8	10.3	9.2	9.3	9.2
	Cond.	222				218
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.5	7.5	7.6	7.7
	O2 ppm	10.0	9.6	9.2	9.4	9.2
	Cond.	210				205
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.5	7.6	7.6	7.7
	O2 ppm	10.0	10.0	9.4	9.6	9.4
	Cond.	196				192
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.6	7.6	7.6	7.7
	O2 ppm	9.8	10.2	9.4	9.8	9.2
	Cond.	182				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.3	7.5	7.5	7.6	7.6
	O2 ppm	10.3	9.8	9.1	9.4	9.2
	Cond.	172				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.5	7.4	7.5	7.6
	O2 ppm	10.1	9.6	9.2	9.6	9.4
	Cond.	168				174
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.2	7.4	7.3
	O2 ppm	9.8	8.9	8.6	9.2	9.4
	Cond.	172				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.3
	O2 ppm	9.8	8.4	8.2	8.6	9.2
	Cond.	170				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890073

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:10	44:10	70:10	96:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890073

TEST CONC. %		ELAPSED TIME 00:00	19:10	44:10	70:10	96:15
100	pH	7.7	7.5	7.2	7.5	7.4
	O2 ppm	9.7	9.3	8.6	8.6	8.6
	Cond.	231				232
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.5	7.5	7.2	7.5	7.4
	O2 ppm	9.5	8.4	8.6	8.7	8.6
	Cond.	220				220
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.5	7.2	7.4	7.5
	O2 ppm	9.6	8.8	9.1	9.2	9.5
	Cond.	210				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.1	7.5	7.1	7.4	7.4
	O2 ppm	9.4	8.3	9.0	9.1	9.1
	Cond.	190				194
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.1	7.3	7.1	7.3	7.2
	O2 ppm	9.2	8.0	7.4	8.7	6.9
	Cond.	182				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.1	7.5	7.1	7.4	7.4
	O2 ppm	9.4	8.8	9.0	9.0	9.0
	Cond.	180				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.4	7.2	7.3	7.3
	O2 ppm	9.1	9.1	9.2	9.5	9.2
	Cond.	183				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.5	7.3	7.3	7.3
	O2 ppm	10.1	8.5	8.2	9.0	9.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890100

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1800

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:00	40:30	64:00	95:30	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	1	1	10
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890100

TEST CONC. %		ELAPSED TIME 00:00	22:00	40:30	64:00	95:30
100	pH	7.9	7.5	7.7	7.7	7.7
	O2 ppm	9.1	9.2	9.4	9.1	9.3
	Cond.	510				500
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.5	7.8	7.8	7.8
	O2 ppm	9.3	9.2	9.9	9.4	9.5
	Cond.	436				411
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.4	7.4	7.8	7.7
	O2 ppm	9.8	9.7	9.5	9.4	9.4
	Cond.	361				349
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.2	7.4	7.4	7.7	7.7
	O2 ppm	9.8	9.8	9.5	9.2	9.3
	Cond.	245				250
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.4	7.6	7.7	7.7
	O2 ppm	9.8	9.8	9.2	8.9	9.0
	Cond.	191				195
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.1	7.4	7.7	7.7	7.7
	O2 ppm	9.9	9.6	9.6	9.4	9.8
	Cond.	171				173
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.8	7.7
	O2 ppm	10.0	9.8	10.2	9.8	10.3
	Cond.	167				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.7	7.7
	O2 ppm	10.0	10.2	9.6	9.6	9.8
	Cond.	169				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Shell Canada Products Limited, Sarnia (510107)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
Data for thirteen Daphnia magna acute lethality toxicity tests conducted on samples collected between June and November 1989 were supplied by Shell Canada Products Limited in Sarnia. Six samples of process effluent were not acutely lethal to Daphnia. One sample of process effluent tested in the M.O.E. laboratory was also non-lethal.

Two samples of cooling water to Talford Creek and three samples of cooling water from POW were not acutely lethal to Daphnia.

Two samples of intake water were non-lethal.

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intake water

05890055 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890076 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05890049 sampled: 06/12/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890054 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890061 sampled: 08/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890071 sampled: 09/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890074 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890099 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890267 sampled: 11/20/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

SW to Talford creek

CW to Talford Creek

05890056 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890075 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW from POW

05890057 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890073 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890100 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO from storm pond

SW to Baby creek

CW to POW

TOXICITY TEST REPORT Sample: 05890055

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1140

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	2	16
13	0	0	0
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890055

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.9	7.8
	O2 ppm	10.2	9.4
	Cond.	240	232
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	9.6	9.2
	Cond.	370	370
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.6	9.0
	Cond.	430	422
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.5	9.4
	Cond.	460	462
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.5	9.2
	Cond.	474	479
	Temp(C)	20.0	20.0
Control	pH	7.9	8.0
	O2 ppm	9.8	9.2
	Cond.	490	490
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890076

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1110

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:20	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890076

TEST CONC.		ELAPSED TIME	
%		00:00	48:20
100	pH	7.8	7.9
	O2 ppm	9.7	8.9
	Cond.	260	280
	Temp(C)	20.0	20.0
50	pH	7.9	8.0
	O2 ppm	9.4	8.9
	Cond.	390	400
	Temp(C)	20.0	20.0
26	pH	8.0	8.1
	O2 ppm	9.4	9.0
	Cond.	448	455
	Temp(C)	20.0	20.0
13	pH	8.0	8.1
	O2 ppm	9.3	8.9
	Cond.	478	481
	Temp(C)	20.0	20.0
6	pH	8.0	8.1
	O2 ppm	9.3	9.0
	Cond.	490	490
	Temp(C)	20.0	20.0
Control	pH	8.0	8.1
	O2 ppm	9.6	9.2
	Cond.	498	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890049

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/12/89
Received : 06/12/89
Tested : 06/13/89 at: 1040

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	02:10	48:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890049

TEST CONC. %		ELAPSED TIME 02:10	48:00
100	pH	7.4	7.6
	O2 ppm	8.6	8.2
	Cond.	700	720
	Temp(C)	20.0	20.0
50	pH	7.8	7.7
	O2 ppm	9.1	8.4
	Cond.	580	600
	Temp(C)	20.0	20.0
26	pH	7.9	7.8
	O2 ppm	9.2	8.4
	Cond.	520	540
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.4	8.6
	Cond.	500	540
	Temp(C)	20.0	20.0
6	pH	8.1	7.9
	O2 ppm	9.5	8.8
	Cond.	488	500
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.6	9.0
	Cond.	474	490
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890054

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1405

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:35	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890054

TEST CONC. %		ELAPSED TIME 00:00	48:35
100	pH	7.5	7.8
	O2 ppm	8.8	8.6
	Cond.	600	630
	Temp(C)	20.0	20.0
50	pH	7.8	7.9
	O2 ppm	9.2	9.0
	Cond.	540	580
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.2	9.2
	Cond.	520	520
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.4	9.2
	Cond.	500	510
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	9.4	9.2
	Cond.	500	500
	Temp(C)	20.0	20.0
Control	pH	7.9	8.0
	O2 ppm	9.8	9.3
	Cond.	490	493
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890061

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 08/14/89
Received : 08/14/89
Tested : 08/15/89 at: 1030

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890061

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.7	7.9
	O2 ppm	7.8	8.4
	Cond.	700	700
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	8.8	8.5
	Cond.	580	600
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.9	8.6
	Cond.	520	520
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	9.0	8.7
	Cond.	520	520
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.1	8.8
	Cond.	492	500
	Temp(C)	20.0	20.0
Control	pH	8.2	8.0
	O2 ppm	9.2	9.0
	Cond.	480	496
	Temp(C)	20.0	20.0

TOXICITY TEST REPORT Sample: 05890071

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 09/11/89
Received : 09/11/89
Tested : 09/13/89 at: 1145

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:55	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890071

TEST CONC. %		ELAPSED TIME 00:00	48:55
100	pH	7.4	7.4
	O2 ppm	8.8	7.9
	Cond.	490	485
	Temp(C)	20.0	20.0
50	pH	7.5	7.5
	O2 ppm	9.0	8.2
	Cond.	492	490
	Temp(C)	20.0	20.0
26	pH	7.7	7.6
	O2 ppm	9.2	8.6
	Cond.	495	488
	Temp(C)	20.0	20.0
13	pH	7.8	7.7
	O2 ppm	9.4	8.8
	Cond.	490	485
	Temp(C)	20.0	20.0
6	pH	7.7	7.7
	O2 ppm	9.4	9.1
	Cond.	492	470
	Temp(C)	20.0	20.0
Control	pH	7.9	7.7
	O2 ppm	9.4	9.2
	Cond.	500	480
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890074

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/02/89 at: 1700

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890074

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.3	7.7
	O2 ppm	5.6	8.1
	Cond.	510	510
	Temp(C)	20.0	20.0
50	pH	7.6	7.8
	O2 ppm	7.4	8.4
	Cond.	510	510
	Temp(C)	20.0	20.0
26	pH	7.8	7.9
	O2 ppm	8.1	8.6
	Cond.	520	500
	Temp(C)	20.0	20.0
13	pH	7.9	8.0
	O2 ppm	8.4	8.6
	Cond.	450	500
	Temp(C)	20.0	20.0
6	pH	7.8	8.0
	O2 ppm	8.5	8.8
	Cond.	480	500
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.1	9.2
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890099

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1210

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890099

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.4	7.8
	O2 ppm	6.8	7.4
	Cond.	760	760
	Temp(C)	20.0	20.0
50	pH	7.7	7.8
	O2 ppm	8.6	8.1
	Cond.	600	580
	Temp(C)	20.0	20.0
26	pH	7.7	7.9
	O2 ppm	9.0	8.5
	Cond.	498	500
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.2	8.6
	Cond.	452	452
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.4	8.8
	Cond.	426	422
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.6	8.9
	Cond.	400	400
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890267

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 11/20/89
Received : 11/22/89
Tested : 11/22/89 at: 1305

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890267

TEST CONC.		ELAPSED TIME			
%		00:00	01:00	24:00	48:00
100	pH	7.1			7.1
	O2 ppm	8.7			7.2
	Cond.	697			693
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	7.4			7.8
	O2 ppm	9.1			7.5
	Cond.	557			534
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	7.6			7.7
	O2 ppm	9.2			7.3
	Cond.	420			428
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	7.7			7.8
	O2 ppm	9.2			7.3
	Cond.	360			371
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	7.8			7.9
	O2 ppm	9.2			7.7
	Cond.	333			332
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	7.7			7.9
	O2 ppm	9.3			7.9
	Cond.	309			298
	Temp(C)	20.0	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890056

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1120

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:10	%
100	0	2	16
50	0	3	25
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890056

TEST CONC.		ELAPSED TIME	
%		00:00	48:10
100	pH	7.9	7.5
	O2 ppm	9.0	9.2
	Cond.	236	248
	Temp(C)	20.0	20.0
50	pH	7.9	7.6
	O2 ppm	9.4	9.4
	Cond.	370	378
	Temp(C)	20.0	20.0
26	pH	7.9	7.8
	O2 ppm	9.5	9.2
	Cond.	430	440
	Temp(C)	20.0	20.0
13	pH	7.9	7.8
	O2 ppm	9.6	9.2
	Cond.	462	471
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.8	9.2
	Cond.	480	489
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.8	9.4
	Cond.	490	498
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890075

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1045

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	49:05	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890075

TEST CONC. %		ELAPSED TIME 00:00	49:05
100	pH	7.9	7.9
	O2 ppm	9.2	8.6
	Cond.	270	285
	Temp(C)	20.0	20.0
50	pH	7.9	8.0
	O2 ppm	9.4	8.9
	Cond.	396	402
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	9.5	8.9
	Cond.	450	458
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.5	9.2
	Cond.	480	485
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.6	9.2
	Cond.	492	495
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.6	9.3
	Cond.	498	495
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890057

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1150

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:50	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890057

TEST CONC. %		ELAPSED TIME 00:00	48:50
100	pH	8.0	7.7
	O2 ppm	9.1	9.2
	Cond.	246	242
	Temp(C)	20.0	20.0
50	pH	8.0	7.8
	O2 ppm	9.4	9.3
	Cond.	372	380
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.6	9.2
	Cond.	434	440
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.6	9.3
	Cond.	462	470
	Temp(C)	20.0	1.0
6	pH	8.0	7.9
	O2 ppm	9.6	9.2
	Cond.	480	485
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.8	9.4
	Cond.	490	494
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890073

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/02/89 at: 1710

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	47:40	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890073

TEST CONC. %		ELAPSED TIME 00:00	47:40
100	pH	8.0	7.8
	O2 ppm	8.0	8.8
	Cond.	280	270
	Temp(C)	20.0	20.0
50	pH	8.1	7.9
	O2 ppm	8.5	9.0
	Cond.	405	400
	Temp(C)	20.0	20.0
26	pH	8.1	7.9
	O2 ppm	8.6	9.0
	Cond.	455	455
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	8.6	9.0
	Cond.	480	480
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	8.4	9.0
	Cond.	480	490
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.1	8.0
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890100

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1150

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:35	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890100

TEST CONC. %		ELAPSED TIME 00:00	48:35
100	pH	8.0	8.0
	O2 ppm	9.0	8.4
	Cond.	580	580
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	9.2	8.4
	Cond.	482	482
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	9.2	8.6
	Cond.	444	452
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.2	8.7
	Cond.	424	432
	Temp(C)	20.0	20.0
6	pH	7.9	8.0
	O2 ppm	9.2	8.7
	Cond.	400	420
	Temp(C)	20.0	20.0
Control	pH	7.9	8.0
	O2 ppm	9.4	8.7
	Cond.	400	408
	Temp(C)	20.0	20.0

COMPANY: Suncor Inc., Sarnia
(490102)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six acute lethality trout bioassays, conducted on process effluent samples collected between June and November 1989 were provided by Suncor Inc. All six process effluent samples were determined to have been not acutely lethal to test fish. Toxicity tests also conducted on six intake water samples and two cooling water effluent samples were also determined non-lethal.

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intake water

05890046 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890052 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890058 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890067 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890079 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890102 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05890047 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890053 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890059 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890066 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890078 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890101 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890291 sampled: 12/13/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

cooling water

05890048 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890069 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

landfarm leachate

MISA - Trout

TOXICITY TEST REPORT Sample: 05890046

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/07/89 at: 1200

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:30	46:15	74:30	97:00	%
Control	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890046

TEST CONC.		ELAPSED TIME				
%		00:00	21:30	46:15	74:30	97:00
Control	pH	7.7	7.5	7.5		7.4
	O2 ppm	9.6	8.8	9.2		10.0
	Cond.	416				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.7	7.5	7.5		7.5
	O2 ppm	9.7	8.8	9.2		9.7
	Cond.	420				405
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.4	7.4	7.4	7.3
	O2 ppm	10.2	8.8	9.0	9.4	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.9	7.3	7.4	7.4	7.3
	O2 ppm	10.4	8.8	9.1	9.4	9.4
	Cond.	168				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890052

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/05/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:55	49:55	73:55	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890052

TEST CONC. %		ELAPSED TIME 00:00	22:55	49:55	73:55	96:00
100	pH	7.9	7.6	7.6	7.6	7.6
	O2 ppm	9.2	9.8	9.1	9.2	8.6
	Cond.	450				440
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.9	7.7	7.6	7.2	7.6
	O2 ppm	9.2	9.7	9.2	9.5	9.0
	Cond.	452				442
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.2	7.4	7.3
	O2 ppm	9.8	8.9	8.6	9.2	9.4
	Cond.	172				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.2	7.2	7.4	7.3
	O2 ppm	9.8	9.2	8.2	8.6	9.2
	Cond.	170				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890058

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/09/89 at: 1100

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	23:00	46:00	69:30	96:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890058

TEST CONC.		ELAPSED TIME				
%		00:00	23:00	46:00	69:30	96:30
100	pH	7.8	7.5	7.5	7.4	7.5
	O2 ppm	9.6	9.0	9.5	9.0	9.1
	Cond.	399				388
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.8	7.5	7.5	7.4	7.4
	O2 ppm	9.6	9.2	9.5	9.1	9.3
	Cond.	400				390
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	7.4	7.4	7.4	7.4
	O2 ppm	10.2	9.6	10.0	9.4	9.2
	Cond.	165				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	7.4	7.4	7.4	7.4
	O2 ppm	10.0	9.0	9.8	9.0	9.3
	Cond.	164				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890067

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	48:00	73:00	96:20	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890067

TEST CONC.		ELAPSED TIME				
%		00:00	19:00	48:00	73:00	96:20
100	pH	7.9	7.3	7.2	7.1	7.2
	O2 ppm	9.8	9.3	8.2	8.2	7.6
	Cond.	422				422
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.9	7.3	7.3	7.1	7.2
	O2 ppm	10.0	8.1	8.3	8.0	7.0
	Cond.	422				422
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.1	7.2	7.2	7.2
	O2 ppm	10.2	9.2	8.4	8.3	8.2
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.1	7.2	7.2	7.2
	O2 ppm	10.2	9.0	8.5	8.6	8.4
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890079

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	17:55	43:55	69:55	96:05	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890079

TEST CONC. %		ELAPSED TIME 00:00	17:55	43:55	69:55	96:05
100	pH	7.7	7.4	7.5	7.4	7.4
	O2 ppm	8.4	8.4	8.9	8.6	8.2
	Cond.	420				450
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.7	7.3	7.4	7.5	7.4
	O2 ppm	9.6	8.3	8.2	8.3	8.2
	Cond.	430				460
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.2	7.4	7.4	7.4
	O2 ppm	10.1	8.9	8.5	8.3	8.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.1	7.3	7.3	7.3
	O2 ppm	10.0	9.2	8.8	8.7	8.2
	Cond.	173				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890102

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1800

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OHE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:30	40:30	64:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890102

TEST CONC.		ELAPSED TIME				
%		00:00	22:30	40:30	64:00	96:00
100	pH	7.9	7.4	7.9	7.9	7.9
	O2 ppm	10.0	10.2	10.1	10.2	10.1
	Cond.	302				289
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.9	7.4	7.8	7.8	7.8
	O2 ppm	10.2	9.6	9.6	10.2	10.2
	Cond.	305				287
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.8	7.7
	O2 ppm	10.0	9.8	10.2	9.8	10.3
	Cond.	167				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.7	7.7
	O2 ppm	10.0	10.2	9.8	9.6	9.8
	Cond.	169				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 05890047

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/06/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	21:00	43:00	68:25	96:00	TOTAL MORTALITY
%						%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890047

TEST CONC. %		ELAPSED TIME 00:00	21:00	43:00	68:25	96:00
100	pH	7.1	7.1	7.2	7.2	7.2
	O2 ppm	8.0	8.8	8.8	9.2	9.2
	Cond.	1040				1110
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.0	7.2	7.2	7.2
	O2 ppm	8.2	8.6	8.8	9.2	9.5
	Cond.	1020				1100
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.3	7.4	7.4	7.3
	O2 ppm	9.5	8.6	8.4	9.4	10.1
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.4	7.5	7.4	7.4
	O2 ppm	9.5	9.2	9.0	9.4	10.1
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890053

TEST CONDITIONS

Company	: Suncor Inc. Sarnia, ONT (490102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: Process Effluent, (300)
Laboratory	: Pollutech
Sampling Method	: grab
Sampled By	: C. Ferguson
Date Collected	: 07/04/89
Received	: 07/04/89
Tested	: 07/05/89 at: 1400
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	27:00	51:00	75:00	97:45	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50	: Non-lethal
95% fid. limits	: 0.0 - 0.0 %
Comments	:

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890053

TEST CONC. %		ELAPSED TIME 00:00	27:00	51:00	75:00	97:45
100	pH	7.4	7.3	7.3	7.3	7.5
	O2 ppm	8.1	7.2	7.2	8.2	8.4
	Cond.					1020
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	7.3	7.3	7.3	7.5
	O2 ppm	9.4	8.2	8.2	8.8	8.4
	Cond.					1030
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.2	7.2	7.4	7.3
	O2 ppm	8.9	8.6	8.6	9.2	9.4
	Cond.					175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.2	7.2	7.4	7.3
	O2 ppm	9.2	8.2	8.2	8.6	9.2
	Cond.					175
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890059

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/09/89 at: 1100

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	23:00	46:00	69:30	96:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890059

TEST CONC. %		ELAPSED TIME 00:00	23:00	46:00	69:30	96:30
100	pH	7.4	7.4	7.4	7.4	7.4
	O2 ppm	9.3	9.4	9.6	9.2	9.1
	Cond.	1050				1000
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.4	7.4	7.4	7.4	7.4
	O2 ppm	9.2	9.4	9.8	9.3	9.0
	Cond.	1050				1000
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	7.4	7.4	7.4	7.4
	O2 ppm	10.2	9.6	10.0	9.4	9.2
	Cond.	165				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	7.4	7.4	7.4	7.4
	O2 ppm	10.0	9.0	9.8	9.0	9.3
	Cond.	164				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 05890066

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	42:45	66:45	96:20	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890066

TEST CONC.		ELAPSED TIME				
%		00:00	19:00	42:45	66:45	96:20
100	pH	6.9	6.9	7.0	6.8	6.9
	O2 ppm	9.1	8.4	7.4	7.6	7.8
	Cond.	1020				1000
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	6.9	6.9	7.0	6.8	6.9
	O2 ppm	9.0	8.0	7.5	7.8	6.8
	Cond.	1000				1000
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.1	7.2	7.7	7.2
	O2 ppm	10.2	9.2	8.4	8.3	8.2
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.1	7.2	7.7	7.2
	O2 ppm	10.2	9.0	8.5	8.6	8.4
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890078

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/03/89 at: 1545

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:55	44:25	69:55	96:05	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890078

TEST CONC. %		ELAPSED TIME 00:00	19:55	44:25	69:55	96:05
100	pH	7.3	7.4	7.3	7.3	7.4
	O2 ppm	8.9	8.1	8.2	8.5	8.4
	Cond.	1210				1120
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.4	7.4	7.4	7.4
	O2 ppm	8.7	8.1	8.8	8.9	8.4
	Cond.	1200				1120
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.2	7.4	7.4	7.4
	O2 ppm	10.1	8.9	8.6	8.0	8.0
	Cond.	175				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.1	7.3	7.3	7.3
	O2 ppm	10.0	9.2	8.8	8.7	8.2
	Cond.	173				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890101

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1800

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:30	40:00	64:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890101

TEST CONC. %		ELAPSED TIME 00:00	22:30	40:00	64:00	96:00
100	pH	7.3	7.0	7.3	7.4	7.4
	O2 ppm	9.0	9.8	9.8	9.8	9.8
	Cond.	1100				1080
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.0	7.4	7.4	7.4
	O2 ppm	9.1	9.9	10.1	10.0	10.0
	Cond.	1120				1040
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.8	7.8	7.7
	O2 ppm	10.0	9.8	10.2	9.8	10.3
	Cond.	167				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.2	7.4	7.7	7.7	7.7
	O2 ppm	10.0	10.2	9.8	9.6	9.8
	Cond.	169				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 01890291

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Nethercott
Date Collected : 12/13/89
Received : 12/14/89
Tested : 12/15/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	00:30	01:00	02:00	04:00	24:00	49:00	69:30	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890291

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	24:00	49:00	69:30	96:0
100	pH	7.0		7.2			7.6	7.5	7.5	7.
	O2 ppm	10.0		10.6			10.8	10.6	9.7	9.
	Cond.	1000		980			945	960	1000	100
	Temp(C)	14.0		14.0			14.0	14.0	14.0	14.
65	pH			7.4			7.7	7.7	7.7	7.
	O2 ppm			10.6			10.8	10.6	9.8	9.
	Cond.			700			700	710	740	80
	Temp(C)			14.0			14.0	14.0	14.0	14.
40	pH			7.6			7.7	7.7	7.8	7.
	O2 ppm			10.7			10.7	10.5	9.7	9.
	Cond.			520			540	540	520	54
	Temp(C)			14.0			14.0	14.0	14.0	14.
30	pH			7.7			7.8	7.8	7.9	7.
	O2 ppm			10.8			10.7	10.6	9.8	9.
	Cond.			460			465	480	470	46
	Temp(C)			14.0			14.0	14.0	14.0	14.
20	pH			7.7			7.6	7.7	7.9	7.
	O2 ppm			10.8			9.9	10.6	9.9	9.
	Cond.			400			400	390	405	40
	Temp(C)			14.0			14.0	14.0	14.0	14.
10	pH			7.8			7.9	7.7	7.8	7.
	O2 ppm			10.8			10.8	10.4	9.6	9.
	Cond.			385			330	325	320	34
	Temp(C)			14.0			14.0	14.0	14.0	14.
Control	pH			7.9			7.8	7.7	7.8	7.
	O2 ppm			10.7			10.7	10.2	9.6	9.
	Cond.			245			230	240	245	26
	Temp(C)			14.0			14.0	14.0	14.0	14.

MISA - Trout

TOXICITY TEST REPORT Sample: 05890048

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/06/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:00	43:00	68:25	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890048

TEST CONC. %		ELAPSED TIME 00:00	21:00	43:00	68:25	96:00
100	pH	7.7	7.5	7.7	7.6	7.5
	O2 ppm	9.0	9.1	9.0	9.4	9.8
	Cond.	418				398
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.4	7.4	7.5	7.5	7.4
	O2 ppm	9.2	8.5	8.8	9.0	9.8
	Cond.	360				362
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.3	7.5	7.4	7.4
	O2 ppm	9.4	8.2	8.4	9.0	9.5
	Cond.	306				312
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.0	7.4	7.5	7.4	7.4
	O2 ppm	9.6	8.7	8.4	8.4	9.5
	Cond.	228				238
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	6.9	7.4	7.6	7.5	7.5
	O2 ppm	9.6	8.8	8.8	9.2	8.9
	Cond.	190				201
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	6.9	7.4	7.7	7.6	7.6
	O2 ppm	9.6	9.0	9.2	9.4	9.5
	Cond.	168				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.3	7.4	7.4	7.3
	O2 ppm	9.5	8.6	8.4	9.4	10.1
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	6.8	7.4	7.5	7.4	7.4
	O2 ppm	9.5	9.2	9.0	9.4	10.1
	Cond.	168				178
	Temp(C)	15.0	15.0		15.0	15.0

MISA - Trout

TOXICITY TEST REPORT Sample: 05890069

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	42:45	66:45	96:20	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890069

TEST CONC. %		ELAPSED TIME 00:00	19:00	42:45	66:45	96:20
100	pH	8.0	7.4	7.3	7.3	7.2
	O2 ppm	9.8	9.2	8.9	8.8	7.8
	Cond.	412				400
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.5	7.3	7.3	7.2
	O2 ppm	9.8	9.2	8.8	8.8	7.4
	Cond.	354				342
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.3	7.2	7.3	7.2
	O2 ppm	9.9	8.9	8.4	8.6	8.2
	Cond.	308				300
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.2	7.2	7.3	7.2
	O2 ppm	9.9	8.7	8.5	8.4	8.4
	Cond.	232				230
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.3	7.2	7.3	7.1
	O2 ppm	10.0	9.1	8.3	8.2	7.2
	Cond.	196				196
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.2	7.2	7.3	7.1
	O2 ppm	10.1	9.4	8.4	8.1	7.4
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.1	7.2	7.2	7.2
	O2 ppm	10.2	9.2	8.4	8.3	8.2
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.1	7.2	7.2	7.2
	O2 ppm	10.2	9.0	8.5	8.6	8.4
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Suncor Inc., Sarnia
(490102)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
Data for fourteen Daphnia magna acute lethality toxicity tests conducted on effluent samples collected between June and November 1989 were submitted by Suncor Inc. in Sarnia. Six process effluent samples were not acutely lethal to Daphnia. One process effluent sample tested in the M.O.E. laboratory in November was non-lethal.

Two cooling water effluent samples were not acutely lethal to Daphnia.

Six intake water samples were non-lethal.

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intake water

05890046 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890052 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890058 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890067 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890079 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890102 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05890047 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890053 sampled: 07/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890059 sampled: 08/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890066 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890078 sampled: 10/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890101 sampled: 11/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890274 sampled: 11/22/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

cooling water

05890048 sampled: 06/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890069 sampled: 09/05/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

landfarm leachate

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890046

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/07/89 at: 1015

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	49:25	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890046

TEST CONC.		ELAPSED TIME 00:00	49:25
%			
100	pH	7.7	7.7
	O2 ppm	9.8	8.7
	Cond.	458	460
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	9.6	8.8
	Cond.	472	484
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.6	8.7
	Cond.	482	490
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.6	8.7
	Cond.	482	490
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.7	8.8
	Cond.	484	490
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.8	8.8
	Cond.	480	490
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890052

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/07/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	47:30	%
100	0	1	8
50	0	0	0
26	0	0	0
13	0	3	25
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890052

TEST CONC. %		ELAPSED TIME 00:00	47:30
100	pH	7.9	7.7
	O2 ppm	9.5	8.6
	Cond.	460	500
	Temp(C)	20.0	20.0
50	pH	7.9	7.8
	O2 ppm	9.4	8.7
	Cond.	480	500
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.3	8.8
	Cond.	480	500
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.3	8.8
	Cond.	480	500
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.3	9.0
	Cond.	500	500
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.6	9.1
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890058

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/09/89 at: 1230

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:30	48:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890058

TEST CONC.		ELAPSED TIME 00:30	48:00
%			
100	pH	7.9	7.7
	O2 ppm	9.6	8.9
	Cond.	430	445
	Temp(C)	20.0	20.0
50	pH	7.9	7.8
	O2 ppm	9.4	9.0
	Cond.	468	478
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.5	9.2
	Cond.	490	496
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.4	9.2
	Cond.	495	498
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	9.5	9.4
	Cond.	492	498
	Temp(C)	20.0	20.0
Control	pH	8.0	7.8
	O2 ppm	9.5	9.4
	Cond.	498	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890067

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1120

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:25	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890067

TEST CONC.		ELAPSED TIME	
%		00:00	48:25
100	pH	7.9	7.7
	O2 ppm	9.4	9.0
	Cond.	450	450
	Temp(C)	20.0	20.0
50	pH	7.5	7.7
	O2 ppm	8.8	9.0
	Cond.	440	480
	Temp(C)	20.0	20.0
26	pH	7.5	7.8
	O2 ppm	8.6	9.2
	Cond.	470	470
	Temp(C)	20.0	20.0
13	pH	7.5	7.8
	O2 ppm	8.3	9.3
	Cond.	470	468
	Temp(C)	20.0	20.0
6	pH	7.4	7.8
	O2 ppm	8.3	9.2
	Cond.	450	420
	Temp(C)	20.0	20.0
Control	pH	7.3	7.7
	O2 ppm	8.4	9.3
	Cond.	470	475
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890079

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/02/89 at: 1545

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890079

TEST CONC.		ELAPSED TIME 00:00	48:10
%			
100	pH	7.9	7.8
	O2 ppm	9.1	9.0
	Cond.	475	442
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	8.8	9.0
	Cond.	490	485
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	8.8	8.9
	Cond.	500	495
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	8.7	9.2
	Cond.	500	500
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	8.6	9.2
	Cond.	490	490
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.1	9.2
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890102

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890102

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.9	8.0
	O2 ppm	9.2	8.6
	Cond.	332	338
	Temp(C)	20.0	20.0
50	pH	7.8	7.9
	O2 ppm	9.2	8.6
	Cond.	370	378
	Temp(C)	20.0	20.0
26	pH	7.8	7.9
	O2 ppm	9.1	8.6
	Cond.	390	392
	Temp(C)	20.0	20.0
13	pH	7.7	7.9
	O2 ppm	9.2	8.8
	Cond.	390	398
	Temp(C)	20.0	20.0
6	pH	7.8	7.9
	O2 ppm	9.2	8.8
	Cond.	400	400
	Temp(C)	20.0	20.0
Control	pH	7.8	7.8
	O2 ppm	9.4	9.0
	Cond.	400	400
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890047

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/06/89 at: 900

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	49:10	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	2	16
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890047

TEST CONC. %		ELAPSED TIME 00:00	49:10
100	pH	7.4	7.4
	O2 ppm	9.4	9.0
	Cond.	1080	1120
	Temp(C)	20.0	20.0
50	pH	7.9	7.7
	O2 ppm	9.6	9.0
	Cond.	800	800
	Temp(C)	20.0	20.0
26	pH	8.0	7.8
	O2 ppm	9.6	9.0
	Cond.	640	640
	Temp(C)	20.0	20.0
13	pH	8.1	7.9
	O2 ppm	9.8	9.0
	Cond.	540	580
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.4	9.0
	Cond.	520	500
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.4	9.0
	Cond.	500	480
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890053

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 07/04/89
Received : 07/04/89
Tested : 07/04/89 at: 1620

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	2	16
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890053

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.5	7.5
	O2 ppm	8.4	8.5
	Cond.	1100	1160
	Temp(C)	20.0	20.0
50	pH	7.8	7.8
	O2 ppm	9.0	8.6
	Cond.	800	800
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.0	8.6
	Cond.	640	660
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.1	8.7
	Cond.	540	580
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.1	8.7
	Cond.	500	500
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.6	8.7
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890059

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : T. Moran
Date Collected : 08/08/89
Received : 08/08/89
Tested : 08/09/89 at: 1200

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:00	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	3	25
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890059

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.6	7.6
	O2 ppm	8.9	9.0
	Cond.	1090	1100
	Temp(C)	20.0	20.0
50	pH	7.8	7.7
	O2 ppm	9.1	9.0
	Cond.	800	805
	Temp(C)	20.0	20.0
26	pH	7.9	7.8
	O2 ppm	9.2	9.0
	Cond.	650	695
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.0	9.2
	Cond.	590	600
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.2	9.2
	Cond.	550	550
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.3	9.2
	Cond.	498	485
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890066

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1105

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:40	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890066

TEST CONC. %		ELAPSED TIME 00:00	48:40
100	pH	7.1	7.3
	O2 ppm	8.8	8.6
	Cond.	1040	1095
	Temp(C)	20.0	20.0
50	pH	7.3	7.5
	O2 ppm	8.7	8.8
	Cond.	700	780
	Temp(C)	20.0	20.0
26	pH	7.3	7.6
	O2 ppm	8.6	9.0
	Cond.	620	610
	Temp(C)	20.0	20.0
13	pH	7.3	7.6
	O2 ppm	8.4	9.0
	Cond.	520	550
	Temp(C)	20.0	20.0
6	pH	7.3	7.6
	O2 ppm	8.4	9.2
	Cond.	500	510
	Temp(C)	20.0	20.0
Control	pH	7.3	7.6
	O2 ppm	8.4	9.2
	Cond.	470	479
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890078

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 10/02/89
Received : 10/02/89
Tested : 10/02/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	48:15	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890078

TEST CONC. %		ELAPSED TIME 00:00	48:15
100	pH	7.4	7.5
	O2 ppm	8.0	8.9
	Cond.	1320	1300
	Temp(C)	20.0	20.0
50	pH	7.8	7.0
	O2 ppm	8.5	9.0
	Cond.	900	890
	Temp(C)	20.0	20.0
26	pH	7.9	7.8
	O2 ppm	8.6	9.2
	Cond.	710	700
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	8.7	9.2
	Cond.	600	600
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	8.9	9.2
	Cond.	550	550
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.1	9.2
	Cond.	500	510
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890101

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 11/06/89
Received : 11/06/89
Tested : 11/07/89 at: 1110

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:15	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890101

TEST CONC.		ELAPSED TIME 00:00	48:15
%			
100	pH	7.5	7.6
	O2 ppm	9.0	8.6
	Cond.	1200	1180
	Temp(C)	20.0	20.0
50	pH	7.7	7.8
	O2 ppm	9.2	8.6
	Cond.	800	780
	Temp(C)	20.0	20.0
26	pH	7.8	7.9
	O2 ppm	9.2	8.6
	Cond.	600	600
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.2	8.6
	Cond.	490	500
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.2	8.6
	Cond.	432	450
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.4	8.7
	Cond.	400	402
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 02890274

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 11/22/89
Received : 11/23/89
Tested : 11/24/89 at: 1355

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890274

TEST CONC.		ELAPSED TIME			
%		00:00	01:00	24:00	48:00
100	pH	7.1			7.5
	O2 ppm	8.9			6.2
	Cond.	1052			1006
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	7.5			7.7
	O2 ppm	9.1			5.9
	Cond.	640			602
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	7.7			7.7
	O2 ppm	9.2			6.0
	Cond.	549			517
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	7.8			7.8
	O2 ppm	9.3			6.1
	Cond.	429			411
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	7.8			7.8
	O2 ppm	9.3			6.4
	Cond.	358			337
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	7.8			7.8
	O2 ppm	9.4			6.1
	Cond.	317			282
	Temp(C)	20.0	20.0	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890048

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 06/05/89
Received : 06/05/89
Tested : 06/07/89 at: 950

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	50:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890048

TEST CONC. %		ELAPSED TIME 00:00	50:10
100	pH	7.8	7.7
	O2 ppm	9.2	8.8
	Cond.	462	480
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	9.2	8.8
	Cond.	480	490
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	9.2	8.6
	Cond.	484	498
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.2	8.6
	Cond.	486	498
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.2	8.7
	Cond.	482	500
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.8	8.7
	Cond.	480	470
	Temp(C)	20.0	20.0

MISA - Daphnia

TOXICITY TEST REPORT Sample: 05890069

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 09/05/89
Received : 09/05/89
Tested : 09/06/89 at: 1135

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:15	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890069

TEST CONC. %		ELAPSED TIME 00:00	48:15
100	pH	7.9	7.7
	O2 ppm	9.0	9.2
	Cond.	450	450
	Temp(C)	20.0	20.0
50	pH	7.6	7.8
	O2 ppm	8.6	9.4
	Cond.	460	482
	Temp(C)	20.0	20.0
26	pH	7.5	7.8
	O2 ppm	8.4	9.4
	Cond.	470	490
	Temp(C)	20.0	20.0
13	pH	7.5	7.8
	O2 ppm	8.2	9.4
	Cond.	476	490
	Temp(C)	20.0	20.0
6	pH	7.5	7.8
	O2 ppm	8.4	9.3
	Cond.	478	488
	Temp(C)	20.0	20.0
Control	pH	7.3	7.8
	O2 ppm	8.4	9.4
	Cond.	470	482
	Temp(C)	20.0	20.0